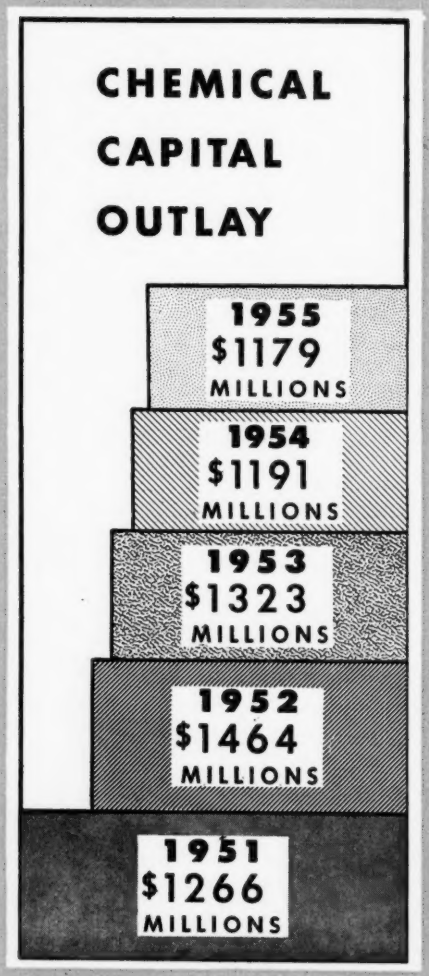
# Chemical Week

February 23, 1952 Price 35 cents

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**CW Report:** Look for three more years of dizzy growth; these are the prospects, perils . . . . . p. 21

**Which process for phthalic?** Fluid bed is versatile, efficient; at least two bet on it . . . . p. 40

**Rug cleaner** gets glamorized in print; result: competitors squawk, but welcome sales spurt . . p. 51

**Hydrogen peroxide** heads for big time with new plants; biggest new use: pulp bleaching . . . . . p. 61

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Chemical Week

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# OPINION . . . . .

## Maker, Not ICC

To The Editor: I have read, with interest, the article "One Round for Rubber Drums" (Jan. 5).

Particularly interesting are the statements with regard to chemicals for which use of rubber drums have been approved.

Interstate Commerce Commission Regulations, which are published in my Freight Tariff No. 8, specify the types of shipping containers that are authorized for various commodities and include shipping container specifications. These specifications include rubber drum ICC Specification No. 43A which is authorized for specific items as specified in the Regulations.

In checking over the list of commodities for which it is stated the rubber drum has been approved, it is noted that sulfurous acid and sodium cyanide are listed. As a matter of information, and for any possible correction that is necessary, neither of these items are approved for shipment in rubber drums.

Naturally we do not know under what condition the word "approved" is used in this editorial, however, the above is pointed out to you for such action as may be necessary.

H. A. Campbell
Chief Inspector
Bureau of Explosives
New York, N. Y.

*In the second paragraph of the story we referred to approval "by the manufacturer." We certainly didn't mean to imply ICC approval, and we hope that our wording doesn't allow any such inference to be drawn.*—Ed.

## Tailor-Made Agents

To The Editor: Dr. Block has taken a rather complex field and has done an outstanding job . . . bringing together a wealth of information in a manner that can be clearly understood by "skilled and unskilled" alike. He is certainly to be commended for his report "Chemicals for Fungus Control" (Jan. 26) . . .

We have been exponents of the principle of protecting all vulnerable commodities, of which there are many, against microbial ravages responsible for rotting and mildewing, etc. We, therefore, deeply appreciate efforts by other researchers and institutions to acquaint technical people and the public at large with the great importance of mildew and rot control.

We are particularly in sympathy with Dr. Block's thorough exposition of the many different types of fungicidal agents which are available today because it is well established that within the broad purview of microbial degradation there are many different conditions and problems which require "tailor-made" control agents to best cope with each specific instance.

This has been the guiding principle in our own research activities, as a result of which specific remedies are suggested for specific manifestations of microbial degradation.

Arthur Minich
Executive Vice President
Nuodex Products Co., Inc.
Elizabeth F, N. J.

## Fungicides at Retail

To The Editor: In the article on fungicides (Jan. 26) . . . you describe Mil-Du-Rid and show it as a product of the Interchemical Corp.

Three years ago we acquired this product as well as Dippo Silver Cleaner, I.C. Degreaser and the Merry-Maid products from Interchemical. They are all household chemical products distributed through . . . department stores, hardware stores, and grocery trade.

If you would be kind enough to print a correction . . . we would appreciate the courtesy.

Fred H. Buck,
Sales Manager,
Ultra Chemical Works, Inc.,
Paterson, N. J.

## Teamwork's the Key

To The Editor: The comprehensive article by S. S. Block: "Chemicals for Fungus Control" (Jan. 26) reflects another example of rapid progress made by teamwork in industry in collaboration with teams in Government agencies, the military, and institutions.

The problem and objectives were defined and emphasized, teamwork supplied, and a lot was accomplished to protect military equipage against organism attack.

P. G. Benignus
Monsanto Chemical Co.
St. Louis, Mo.

## Hefty Gypsum Reserves

To The Editor: We have read your news article "Gypsum, Not Sulfur" (Oct. 13) . . . in which you mention gypsum sources for the Sindri fertilizer factory . . . which has since commenced production.

Raw material for this factory will

# What Properties in an Acid Do You Need Most?

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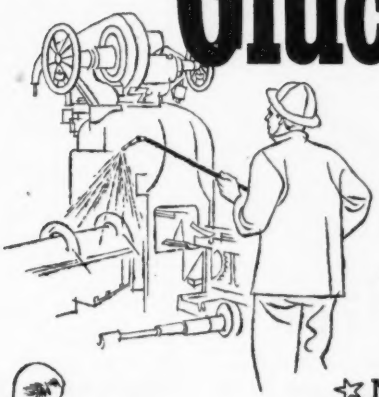

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## OPINION . . . . . .

be brought not from the southern part of India but rather from the north . . .

At the present moment the gypsum mines at Jansar (19 miles from the desert city of Bikaner) are the sole supplier of the Sindri factory. According to present planning the Jansar mine is to supply at least 1,000 tons per day of gypsum to Sindri . . . ultimately perhaps will have to supply three-fourths of its total requirements. The balance . . . will be drawn from deposits in Jodhpur Division of Rajasthan State. . . .

You might be interested to know that Jansar . . . is the largest deposit in India . . . with total estimated reserves of 85.5 million tons. Jodhpur reserves are 16.3 million tons.

In south Madras there is a 15 million ton reserve deposit . . . to meet the requirements of South India . . . including a fertilizer plant at Always, Travancore . . . operated by Chemicals and Fertilizers (Travancore) Ltd. with a production of 50,000 tons of ammonium sulphate per year . . . partly from imported sulphur and partly from gypsum. . . .

H. N. Ganghi
Bikaner Gypsum Ltd.,
Calcutta, India.

### Dept. Store Chemistry

To The Editor: CW's (Feb. 9) report of chemical industry public relations reminds me of my own recent experience in a department store when I purchased a piece of plastic sheeting:

I, making conversation: "Do you know if this sheeting is vinyl plastic?" Saleslady: "*All* plastics are vinyl plastics!" I: "It would be nice if they could make this sheeting so it didn't smell so bad, wouldn't it?" Saleslady: "Well, plastics are all made of chemicals and all chemicals smell bad." I: "Perfumes are made of chemicals, though." The lady let this lie.

So, having gleaned some chemical knowledge that was not covered in either mine or Dick Tracy's High School Chemistry, I took me off home.

Philip D. Adams, Ph.D.
Director of Research
The Andrew Jergens Co.
Cincinnati, Ohio

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: The Editor, Chemical Week, 330 W. 42nd St., New York 36, N. Y.

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# U.S.I. CHEMICAL NEWS

February 23 ★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1952

## Methionine Found To Increase Rate Of Wound Healing

Striking evidence of methionine's value in helping to increase the rate of healing of wounds is found in a recent report of research in the field of protein nutrition. Groups of rats on controlled experimental diets were given the same type of wound, and the tensile strength of the healing tissues was measured at regular intervals. Animals on a methionine-supplemented diet showed the fastest rate of healing of all the groups tested.

Up to now, wound healing was thought to be related to protein nitrogen intake. This report indicates that methionine may be the limiting factor and concludes that methionine increases the efficiency of either dietary protein, tissue protein, or both. Data obtained in the tests showed that wounded tissues require a larger proportion of sulfur to nitrogen than they do under normal conditions. With methionine in the diet, the ratio of sulfur to nitrogen increases, and this may be what causes an increase in the rate at which wounds will heal.

U.S.I. was the first large-scale producer of DL-methionine, an essential sulfur amino acid which finds wide application in the pharmaceutical field and is also used as a supplement in animal feed.

## *New Bonding Technique For Acrylic Plastics*

A new method for cementing acrylic plastics is reported to involve the use of a strippable coating instead of masking tapes as protection against excess cement. Described as bright red, fast-setting, and easy to apply, the coating is claimed to be of particular value when used on irregularly shaped articles where tapes are cumbersome and difficult to apply and remove. Surfaces to be protected are dipped in or painted with the coating, which is not attacked by cements commonly used with acrylics. Pieces can be moved or stored two or three minutes after coating. During bonding, any cement squeezed out of the joint can be scraped, while still wet, onto the dry coating. The coating, along with the excess cement, can then be removed by peeling it off in one piece. The underneath surface is not attacked by the cement, and no adhesive gums are left behind, it is said.

## New Synthetic Lubricant

An aliphatic diester, similar to those used in the manufacture of some plastics, is said to be the base of a new synthetic lubricant, tailor-made for turbo-jet and turbo-prop aircraft engines. The new oil will withstand operating temperatures ranging from minus 65° to plus 500° F. At the lower temperature, it is claimed to be about one-third as viscous as the best petroleum-base product, and at the upper temperature it is one-twentieth as volatile. In addition to the diester, it has been revealed that the lubricant contains phenothiazine to inhibit oxidation at high temperatures and tricresyl phosphate which helps to prevent gear wear. The oil is not intended for reciprocating engines, and it is not expected to replace petroleum products except where military applications require its properties.

# U.S.I. Adds Propionic Acid To Industrial Chemicals Line

### Hydrocarbon Synthesis Yields Versatile Chemical With Growing Applications—U.S.I. to Be Large-Scale Supplier

U.S.I. is further diversifying its service to users of chemical raw materials by becoming a large-scale commercial source of propionic acid. Third in the series of aliphatic acids, propionic acid is one of a number of materials being produced at the hydrocarbon synthesis project in Brownsville, Texas. Here, natural gas is converted to synthetic gasoline, other petroleum products, and crude chemicals by Carthage Hydrocol, Inc. The chemical portion of the output is then recovered and refined in Stanolind Oil and Gas Company's plant. In U.S.I.'s facilities, these products are prepared for the market or for further synthesis at other U.S.I. installations.

**Normal-propyl ester of propionic acid is a good medium evaporating solvent for nitrocellulose and should find wide use in lacquers.**

Propionic acid is a colorless liquid with a pungent odor similar to that of acetic acid. It is separated from the water-soluble stream of the hydrocarbon synthesis and purified to meet rigid quality specifications. Some of its established uses include preparation of

MORE

## *High-Melting Metal Parts Fabricated by Spraying*

A new technique for fabricating large, complex parts of high melting point metals has been developed as a by-product of research into the nature of the metal spraying process, according to a report recently made public. In the course of uncovering the exact process by which a sprayed-metal deposit is built up, scientists evolved a method for forming high melting point metal parts by first spraying the metal onto a core of the desired shape, then sintering the sprayed deposit to form a dense, strong metal part. This new technique is expected to provide a simple, inexpensive means for obtaining the large complex metal shapes that are difficult to fabricate by conventional powder metallurgy, precision casting, or die forging. High melting point alloys as well as elementary metals can be formed by the new process, it is said.

## Alloxan Seen as Possible Cause of Human Diabetes

Alloxan, a chemical closely related to vitamin C, may be the cause of diabetes in humans, according to a theory based on research in which the chemical induced diabetes in animals. It was shown that alloxan causes convulsions, excess sugar in the blood, permanent diabetes, and even death when injected into animals. It is now thought that the chemical can be formed in the human body under certain conditions, and that though it is easily decomposed, it could be retained in the body in a toxic form long enough to do harm. In a report of the work, it was pointed out that much more investigation will be needed before this theory can be accepted as an explanation for the cause of diabetes.

## *Metallic Vapor-Deposition Summarized in New Report*

A recent report summarizes the available literature on formation of refractory coatings by vapor-deposition methods. Previously unpublished research is also included on a new process for plating high purity coatings of temperature-resistant metals and the borides, silicides, carbides, and nitrides of these metals.

## *Explosions Snuffed Out Just Before They Happen With New-Type Bomb*

The best way to prevent an explosion is to blow it up before it can start, according to the inventors of a device designed to snuff out explosions in gas tanks of war planes. The invention is a bomb, about half the size of a grapefruit, which contains carbon tetrachloride. It is placed inside the tank, and when an explosion of gasoline fumes begins, it is detected by a highly sensitive diaphragm built in to the bomb. Within a few thousandths of a second, the bomb goes off, completely damping the explosion with carbon tetrachloride. It is also thought that the bombs could be adapted for use in coal mines to detect potential underground blasts and damp them out before they can take place.

CONTINUED

## *Propionic Acid*

perfume esters and artificial fruit flavors. Salts of propionic acid are fungicides, and sodium and calcium propionates are used in preparations for inhibiting mold in baked foods and for controlling skin fungi. The acid has been used in the production of cellulose plastics and in the preparation of solutions for electroplating nickel. Esters of propionic acid are good solvents for nitrocellulose. With the acid more readily available, new applications for other specialized esters as plasticizers can be expected.

## Volcanic Heat May Solve Future Power Problems

Large-scale utilization of volcanic power may soon help to solve growing fuel problems, according to recently published observations of a geologist. Energy available from gas vents and hot-spring waters of volcanic regions is of fantastic proportions, he declares, and man now has sufficient knowledge to permit the tapping of this reserve.

Heat given off in volcanic eruptions comes from an extremely hot shell of material, far underground, which becomes liquid magma when pressures are reduced by the cracking of rocks above, or when temperatures rise through radioactive heating. The magma rises wherever it finds an opening, and its contact with ground water produces steam — and often violent explosions. During most eruptions, gas pressures may range from 700 to 20,000 pounds per square inch. This power has already been put to use in Iceland for heating buildings and in Italy for generating electricity and for heating fields to raise unseasonal crops. Some of these wells furnish large amounts of chemicals, including boric acid, borax, ammonium carbonate, and carbon dioxide. Acidity of the vapors is one of the technical difficulties standing in the way of large-scale exploitation of this energy, it is said, but wider use is possible in the future.

## New Alkaline Process Derusts Iron Alloys Faster, More Easily

Announcement was made recently of an alkaline derusting process for iron alloys which requires no acid and which can be used in the field with only the assistance of a portable generator. Absence of acid in the process is said to eliminate subsequent rusting, to prevent attack on the base metal, and to operate in a fraction of the time required for acid pickling. In one test, complete rust and scale removal is claimed to have been accomplished in two minutes as against 45 minutes for acid treatment. No heat is required in the process, and if protection of the object being derusted is desired, zinc can be incorporated in the bath to allow cleaning, pickling, and zinc plating in one tank. In operation, the metal parts are made the cathode in a bath of special derusting solution. Speed of derusting is dependent on current density, which can vary over a wide range. The process does not have to be watched closely, it is said, because long treatment does not result in any attack upon the metal.

## *Plastic Stops .45 Bullets At Ten-Yard Range*

A new plastic tough enough to stop a .45 caliber revolver bullet at ten yards has been developed, according to a recent report. Described as an alkyd molding compound reinforced with fiber glass, the new material is claimed to have a higher impact strength and greater resistance to shattering than any other plastic. The compound is supplied already mixed, and it can be molded easily into various shapes by conventional methods with heat and pressure, the company states. In addition, the plastic is claimed to resist heat and to provide good electrical insulation. It is currently being studied for possible military uses including armor plate and projectile heads. Civilian uses are foreseen in refrigerators, washing machines, electronic devices, and automobile parts.

## TECHNICAL DEVELOPMENTS

*Information about manufacturers of these items may be obtained by writing U.S.I.*

**Excellent corrosion-resistant bases** for organic coatings are said to be obtained with a new phosphate compound which changes surfaces of steel, iron, zinc, and cadmium parts to inert compounds. **(No. 769)**

**A new synthetic wax duplicates Japan wax** in all its essential characteristics and is self-emulsifying when melted and added to hot water, according to the manufacturer. **(No. 770)**

**Colored and protective coatings for aluminum,** including shades of brass and gold resembling solid metals, are said to be obtained with a new one-step immersion process applicable to almost all aluminum alloys. **(No. 771)**

**A new heavy-duty vinyl electrical tape,** claimed to be more than twice as thick as previous tapes, is available for underground use and for high-tension leads subject to abrasion and rough handling. **(No. 772)**

**Replacement of castor oil** in many industrial applications is reported possible with a new modified vegetable oil which has the same viscosity, solubility, and non-drying characteristics. **(No. 773)**

**New cements for acrylic plastics** are described as monomer base bonding agents which set readily to produce strong, optically-clear bubble-free joints. **(No. 774)**

**A new acid-alkali-resisting glass,** intended for use in a pH range of 9 to 12, is expected to prove valuable in equipment for neutralization and polymerization reactions. **(No. 775)**

**Remarkable similarity to Carnauba** is claimed for another new wax which is said to be useful in carbon paper, solvent polishes, and other wax-containing products. **(No. 776)**

**Chicken feathers are converted to cloth** and felt by a new process which yields a fiber with characteristics of both silk and wool, according to the inventor. **(No. 777)**

**Hot gas welding guns for thermoplastics** are available in gas heated or electrically heated types. Both operate with nitrogen or compressed air, and nozzle temperatures can be varied from 300° to 700° F., the company states. **(No. 778)**

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Chemical Week
BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

## NEWSLETTER

Washington will put a crimp in the chemical industry's shiny new expansion plans unveiled by McGraw-Hill's annual survey (*CW, Feb. 2*).

The crimper will be additional restrictions on plant construction, now in the planning stage and slated to be ready by July 1.

Whatever the final form, they'll boil down to a system of priorities, and a lot of blueprints won't become plants until 1954.

Structural steel and copper are the bottlenecks; there simply won't be enough—fast enough—to permit realization of industry's plans.

Here's a warning to small and medium-sized companies: Tell NPA immediately how much nickel, selenium and other ferro-alloy metals you need for 1952, or you may be left empty-handed when allocations are made.

But you must explain essentiality with statement of end products for (1) direct military, (2) indirect military and (3) essential civilian needs. Nickel should be scheduled quarterly; selenium, monthly. List possible suppliers. (Nickel salts need not be included.)

NPA's chemical division says the big firms have all filed requests, but some smaller companies may not have gotten the word.

Less likely to be received kindly in chemical circles were these rumblings from Washington this week:

• Senator Alexander Wiley will ask the Rules Committee for authorization to launch his threatened investigation of General Aniline & Film and other properties operated by the Alien Property Office (*CW, Dec. 29*). (In Binghamton, N.Y., GAF president Jack Frye, obviously picking up Wiley's oft-flung gauntlet, said the firm "is prepared to answer . . . questions pertaining to [its] activities, operations, expenses and management.")

• "Chemicalization" of agriculture was accused of putting farmers out of work. This was the gist of a Senate "staff study" revealed by Hubert Humphrey.

The senator also revealed an "instinctive repugnance against sacrificing democratic institutions (presumably the farmer) on the altar of science for . . . greater efficiency . . . larger productivity."

Washington wasn't the only place where unveiling took place.

Allied Chemical & Dye Corp., long known for playing its cards close to its chest, reported it will spend $75 million on expansion this year. This is on top of $45 million spent in 1951. It now has 31 projects under way, will get $80 million certified for fast write-off (60% of a $130 million total expansion).

Other light shed by Allied on its activities: (1) Barrett has its own phenol-from-cumene process developed independently of other producers. (2) It has done plenty of work on coal hydrogenation, but is tepid on it now. (3) Synthetic fibers and plastics are high on its current research program; it's still looking at all three: polyamides, acrylics, polyesters.

Add the Glidden Co. to the list of those with a new titanium process. Glidden has 600,000 tons of ilmenite in North Carolina which it is saving for conversion to metal by its non-electrolytic process.

Far on the other end of the chemical spectrum is Compound F, the cortisone-like material which Glidden makes from soybeans. This project, still in its infancy by Glidden's reckoning, accounted for $1-$1½ million of the company's 1951 profits. It is sold in bulk only to such pharmaceutical houses as Eli Lilly, Upjohn and Abbott Laboratories.

Glidden's appraisal of this year's prospects: not as good during the first half as last year's (because of the high sales volume due to scare-buying then), but a pick-up during the last half.

American Cyanamid Co.'s tentative operating results for 1951 show the familiar pattern of higher taxes canceling higher profits.

Earnings before taxes were up $13.6 million—from $69.7 million last year to $83.3 million.

But allowances for taxes was up $12.5 million—from $36 million in 1951 to $48.5 million. Net earnings were thus up only $1 million.

Hence the net return on a $67 million increase in sales (from $322 million to $389 million) was only about 1½%.

Court test of Texas' natural gas tax (*CW, Feb. 2*) is slated for March 17. Forty-two suits have been filed in four state courts at Austin, seeking recovery of over $2 million in taxes paid since September 1.

Interstate pipeline firms are leading the fight. Their claim: The state can't tax gas moving in interstate commerce.

Chemical companies are divided. Some have paid without protest, others are trying to get their money back.

The shoe is on the other foot at Houston, where the Federal Government is suing a chemical company for alleged OPS violations.

Consolidated Chemical Industries is the defendant in the suit, wherein the District Attorney claims overcharges of $99,023.94 on sales of muriatic acid to 17 purchasers. The alleged overcharges ranged from $2.56 to $4 a ton. The Government seeks triple damages.

In another legislative development, industry is trying to inject more "democracy" into Government-industry contracts.

A recent Supreme Court decision on the standard "disputes clause" held that the head of a Federal department had the final say, and there could be no court appeal except where Government fraud existed.

Now hearings are being held by the Senate Judiciary Committee. Legislation may be forthcoming to permit court review of disputes.

The chemical process industries are avidly following the hearings —small wonder, since Uncle Sam is an increasingly important customer.

Big process news this week is Joy Manufacturing Co.'s semi-portable oxygen generator. Ranging from ½ to 12 tons per day capacity and costing from $20,000 to $175,000, the machines can turn out high-purity oxygen at operating costs (based on the 2-ton unit) of 5¢-10¢ per 100 cu. ft.

Look for another Reader's Digest "plug" a few months hence for a chemical specialty (*cf. p. 51, this issue*): This time it will be a bathtub-to-wall caulking material.

**. . . The Editors**

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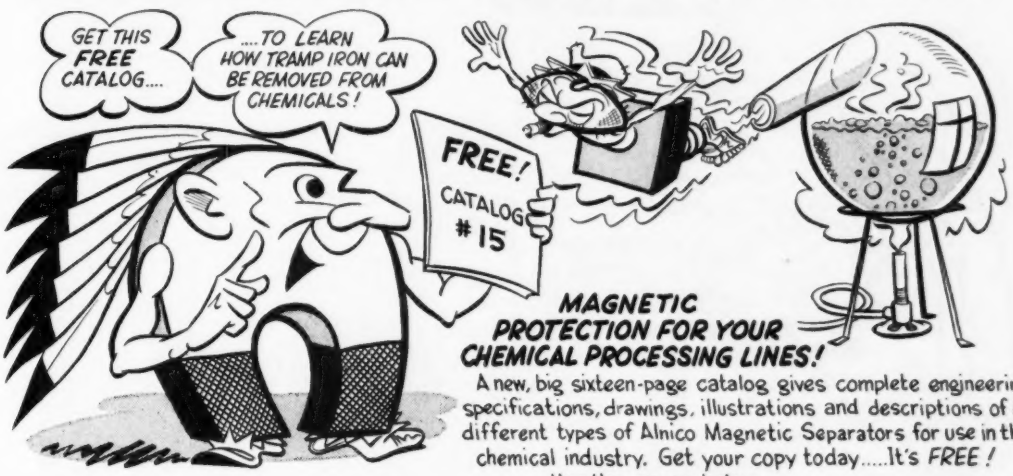


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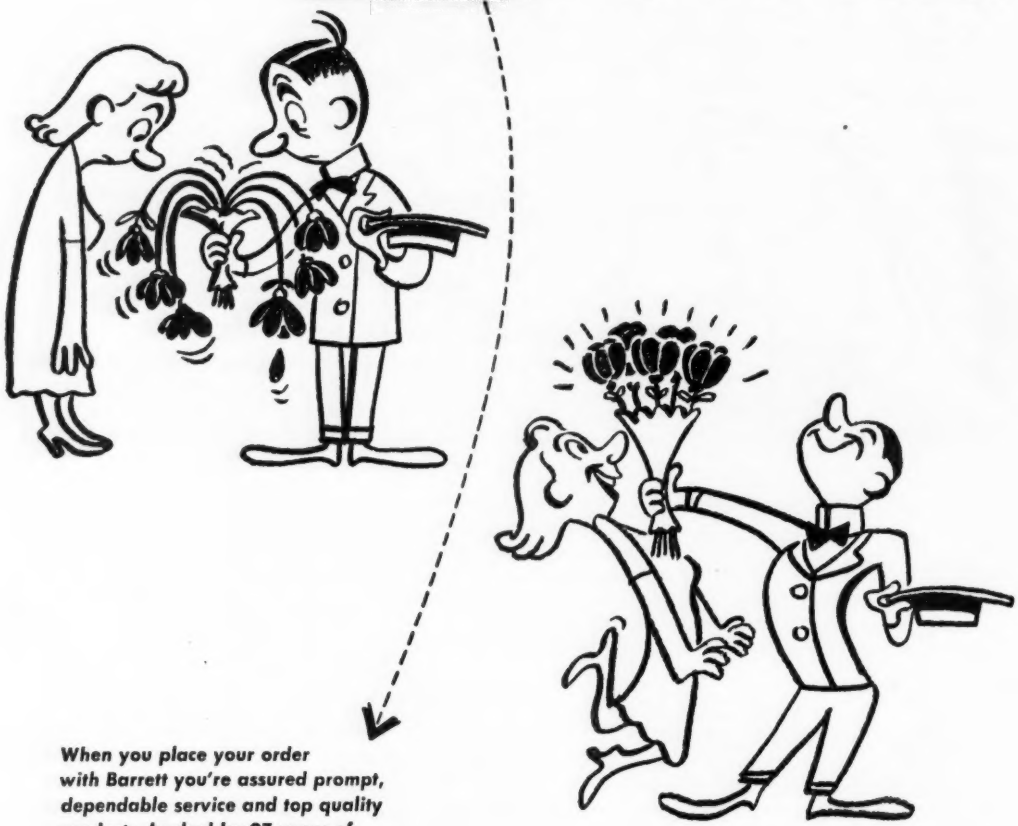

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| Xylenols | "ELASTEX" 50-B* Plasticizer | CUMAR* Paracoumarone-Indene Resin |
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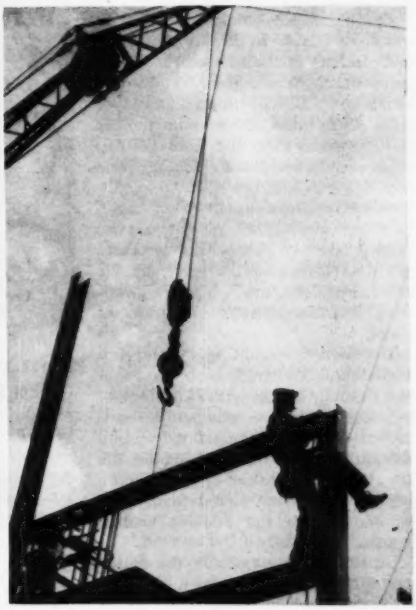
*February 23, 1952 • Volume 70 • Number 8*

Chemical Week

# BUSINESS & INDUSTRY . . . . .



**BUILDING CHEMICAL PLANTS: Workers smile, but management worries.**

## Construction Poser: Materials and Costs

Building materials, labor, are scarce, high priced. Result: Construction men are checking costs more closely.

Structural steel is tightest supplywise; alloy steel for piping is also on the short list.

Trend is to design simplification and to new techniques. One example: use of pre-stressed concrete.

**This week,** as spring and the peak building season neared, industry executives huddled around conference tables to discuss a single question: "What to do about construction materials supply and high costs?"

For an industry that plans to spend $1.46 billion on new plant this year (*see CW Report p. 21*), the answer to this question can't be tossed off lightly.

To find out the answers, CHEMICAL WEEK editors and correspondents throughout the nation last week surveyed construction superintendents of large, medium and small chemical companies. Their answers, of course, varied. Basically, however, they showed that companies are seriously reappraising the essentiality of planned expansion—whether aided by rapid tax depreciation or not—to company growth.

For large companies, these high costs will mean either taking the calculated risk of more debt financing or putting new, potential money-making ideas into cold storage. For companies which believe in financing growth from earnings, expansion may necessitate ditching this principle. For small companies which cannot finance out of earnings and which have difficulty obtaining debt capital, it means a struggle to maintain present competitive positions.

Costs are high, but manufacturers are happy to see that in the past year they have risen only 3%. However, the few soft spots which have shown up in the industry make corporations more aware of the jump in construction costs since 1949, the last soft year.

• **Material Costs.** Price tags on materials which averaged 130% of prewar figures in 1945* jumped to 203% in 1949, and this month are hovering around the 233% mark as a result of post-Korea inflation.

This reflects only the nominal price quotations, and of course does not include expediting costs or gray market charges.

• **Construction Labor Costs.** Average hourly wage (including fringe benefits) which in 1945 averaged

* Material and labor figures from *Engineering News-Record's* building and construction indices.

121% of prewar, shot up to 178% just before Korea and now has reached 206%. Again, however, this reflects only the base wage. Many companies have found that, in order to keep workers, they must give them at least 8 hours of overtime per week, usually at double time.

Of course, the value of a dollar is less than it was in 1939. Adjusting these indices to the BLS non-food and non-farm wholesale price index, materials cost 112% of prewar, and labor 98%. This takes into account neither side expenses nor the fact that in times of inflation money obtained one day is worth less the next.

**Gripe on Government:** "The materials are available. We have even located some of them. But we can't get the Government to give us the necessary allotments." This, in a nutshell, is management's biggest complaint.

If companies want to expand immediately, they must keep up a hot and running liaison with Washington. In some instances, companies have started expansion immediately upon obtaining approval, operating on the theory that it is easier to get material for a partially completed plant than for one still on the drafting boards. It usually works.

Foreign steel—especially the scarce structural shapes—has been used to rush construction. When speed is needed, companies feel the sometime $100-a-ton premium is justifiable. The major location where such buying is prevalent is Texas, far from U.S. steel sources.

The buildings-for-rent classifieds are being scrutinized ever more thoroughly. In some cases, these plants are moved in toto to other points. One company in Texas didn't have enough steel for an office building, but acquired the steel beams used in a Houston football stadium which was being demolished.

**Lament on Labor:** "Unions are working less and raising more hell," one Chicago chief engineer reports. And from all over the country, companies complain that where cost of material was once roughly double that of labor, workers now receive 50-60% of the construction dollar.

Petty featherbedding demands are on the upswing, and as workers become scarce, hiring of less efficient men raises total cost. Companies are, in places, doing a bit of their own construction. They may contract for a structure and later assign their own maintenance men to put up partitions. This, however, can mean strained labor relations.

**Design Doings:** "The costs of a project depend on whether you know at the start exactly what you want, then stick to it."

Major new trend in plant construction is the use of pre-stressed concrete. Utilizing this process makes possible an 80-90% reduction in structural and a 50-60% cut in reinforcing steel.

Design for express purpose, not multiple use; elimination of seldom used equipment—starting-up, standby, by-pass piping; greater use of working scale models; and a northward migration of open-air facilities are all getting play as cost cutters. Companies, of course, are making do without alloy steel piping and similar hard-to-come-by materials.

One Midwest company feels it is cheaper to use more fuel and eliminate insulation. Another is supporting a new building on concrete piers, cutting down over-all foundation costs. In the South, one company has been placing pipelines on concrete piers at ground level, rather than using the customary overhead steel racks.

Panels of popped perlite and cement, previously used in one-story houses, have now been adapted to industrial construction. Panels cost half as much as bricks, are excellent insulators, can be erected in 5 minutes time (comparable to a day of bricklaying). Decrease in weight (60% over brick, 80% over concrete) allows lighter, cheaper foundations.

A major complaint of one Buffalo corporation concerned CPR 30. The company felt that equipment manufacturers have made unnecessary design changes primarily to obtain price relief.

**AEC Angle:** Undoubtedly the largest single influence on process industry construction is the multibillion dollar expansion of the Atomic Energy Commission, which bids against industry for equipment, workers and materials. Construction men, hearing that plumbers, for example, were drawing $756 a week on one rush AEC project,* were openly wondering whether results the Commission gets had passed the point of diminishing return.

But while constructioneers fret, they are resigned to the fact that AEC, with a $6 billion expansion program now before Congress, will be a decided factor over the years to come.

Most important, however, according to the industry, will be Government taxation policies. Excess profits taxes hit hard at "growth" industries. Even closer scrutiny of any expansion plans can be expected in days of rising costs.

This inability to funnel earnings to expansion will continue the trend to debt financing. And here, larger companies hold the high cards.

* This particular case was defended by the AEC as an extremely urgent job. The commission, said Chairman Gordon Dean, is not in the habit of paying such wages.

## Chemicals and Country

**Reichhold Chemicals turns to TV for for institutional advertising campaign, sponsors "Town Meeting" as part of "corporate philanthropy" policy. Commercials are low-pressure, stress chemistry's part in country's industrial progress.**

Reaction to a chemical producer's TV sponsorship of the 17-year radio standby (ABC-TV Sunday nights) continued to surprise and please Henry H. Reichhold, company owner and chairman, last week following the appearance of Herbert Philbrick, the man who turned the spotlight on communists.

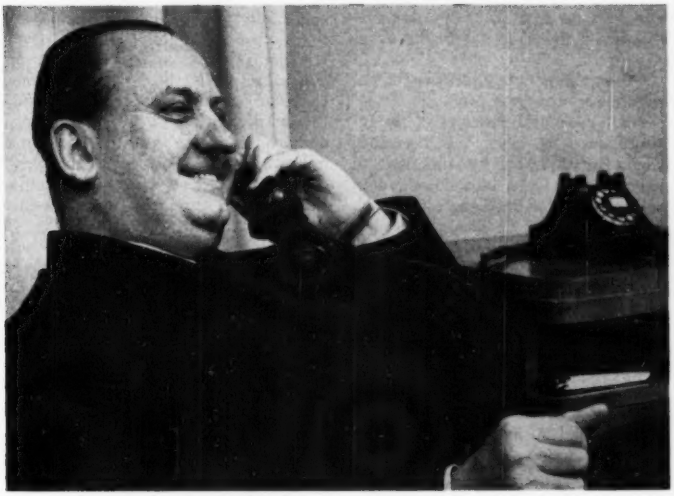
It surprised him because the letters of response indicated a more intense interest in this type of program than he had anticipated; pleased him because many chemical business men lauded the effect: making the public aware of the chemical process industries' role in contemporary life.

But Reichhold's ad agency hopes that the program's Hooper rating won't go too high, for "H. R.," as his associates refer to their large (over 6 ft., 200 lbs. plus) yet soft-spoken (slight Viennese accent) chief, doesn't want to reach too great an audience. "I wouldn't care if they ran Milton Berle opposite us," he avers, for the people he wants to reach are in the minority —"the thinkers in industry and in Washington."

This desire to do something in the nature of public service goes back to Reichhold's early days as a chemist for Ford Motor Co. where he began, a German emigrant, in 1924. He was impressed with the Ford Family Hour on the radio, came to the conclusion that every company should have some money available for such contributions to the nation's cultural life.

**Nothing to Sell:** As principal sponsor of the Detroit Symphony, into which he put some $2 million during 1943-1949, he had absolutely nothing to sell to classical music listeners. A music lover himself, he was happy with his small, select audience, merely mentioned Reichhold Chemicals as the sponsor during broadcasts.

This was his "corporate philanthropy", the idea that private companies must support the arts now that



HENRY H. REICHHOLD: Three C's and a low Hooper.

taxation has made it virtually impossible for individuals to do so.

Since moving his headquarters from Detroit to New York a year ago, Reichhold has sought some other medium for this activity as he went about running his* sprawling resin business (28 plants throughout the world, 9 of which are in the U. S.). He wanted something a little broader than a straight musical program, but, disdaining typical commercial forms of entertainment, he decided on a discussion program. It had to be TV for he prefers to see a man when he talks, has a set in his office to catch people "with something important to say — like Churchill—" when they are on. Town Hall was the program; Sunday night the time. (He's sometimes home at his Chappaqua, N. Y. estate then, can see it himself.)

Reichhold is satisfied with the choice because open discussion on matters of concern to society is fundamental to American tradition, and it jibes with his "personal philosophy of three C's—character, conviction and courage." He believes that only people with such qualities will go to the town hall meeting, either as participants or viewers.

**No One to Impress:** Cost for the initial 13-week schedule will be over $200,000, possibly as high as $300,000. Most likely the company will put the program on a regular 39-week-per-year basis.

This is big money for anyone, even for companies with consumer products or for those aiming at influencing stockholders or prospective stockholders. But sole-owner Reichhold has only himself to impress, only industrial customers for his resins and resin materials.

The program, however, does do an institutional public relations job for the company and for the industry. The slogan, "creative chemistry—your partner in progress," which is inscribed across the moderator's desk, is on screen virtually all the time, burns into a viewer's consciousness.

Commercials are in the same vein. Short and strictly low-pressure, they explain industry's contributions to American life, show Reichhold's role in it by, as in a recent program, displaying a consumer product like a table and pointing out that it is bonded and finished with resin materials.

That's all the sales pitch there is. And Reichhold promises to keep it that way, and to keep Town Meeting on TV—unless its Hooper gets too high.

(*) Probably the largest one-man company anywhere, Reichhold Chemicals has but one name on its single stock certificate: Henry H. Reichhold.

## Kudos for Top Men

**To back up its claim that the chemical process industries are the best managed of all, the American Institute of Management last week named Procter & Gamble as "far and away" the best managed company in the country.**

With a total of 9,425 points out of a possible 10,000 in the Institute's annual management audit, Procter & Gamble rated tops, not only among the 16 chemical concerns dubbed "excellently managed," but also among the entire 298 American companies in all fields to receive the honor.

The relative merit of P & G is more apparent when viewed against the background of the 3,000 companies studied. Of the entire 3,000 only a little less than 10% were deemed well-managed enough to deserve an award, and of these P & G stands first. Even in P & G, however, AIM finds considerable room for improvement.

**Alive and Moving:** Jackson Martindell, president of the non-profit Institute, is emphatic in rating the chemical industry's management as the most "alive," progressive, and fast-moving executive group in the country. Further, the former investment counsellor and founder of the AIM makes no bones about his opinion, based on his years of management studies, that the chemical and allied industries are the best managed, with an outstanding preponderance of good companies to bad.

In the detailed report on the Procter & Gamble Co. the Institute not only presents what it considers a model of management, but a good insight into its own methods. In extolling P & G, and offering a few criticisms at the same time, the Institute bases its analysis on its ten points of basic management.

• **Economic Function.** In giving P & G a perfect score in this category, the AIM maintains, "Operating in a highly competitive industry, Procter & Gamble has consistently maintained its leading position in the production of soaps and detergents."

• **Corporate Structure.** To supervise its 20,000 employees in 35 domestic plants and 11 overseas plants, the company is divided into six large divisions, each headed by a vice-president who actually operates as the president of an autonomous organization. This the AIM finds to be a vigorous setup, particularly since the president does not head a division and so can give all his time to the broader considerations.

• **Earnings Growth.** "Sixty-one years of consistent growth . . . and uninterrupted dividend payments is the remarkable record . . ." says AIM. P & G also lives up to the Institute's standard of financing its growth out of earnings with no long-term funded debt.

According to AIM, P & G's profit margins have shown a healthy if not a spectacular rise. Over the past 30 years the average profit margin has been reasonable, reflecting sound operations, but not remarkable.

• **Fairness To Stockholders.** P&G has shown excellent fairness to its stockholders, paying an average of

70% of earnings as dividends over the past 30 years.

On the debit side, P&G, like many other large industrial concerns, has had its share of anti-trust troubles, which have been both time-consuming and expensive. Further, these troubles appear to be still going on.

• **Research and Development.** With 75 years of continuous research behind it, and 1,500 people now engaged solely in research and development, P&G needs no defense in this category. The detergent story speaks for itself.

Nevertheless, P&G has had its share of troubles in introducing certain products to the market, but has had its large research organization to call on for corrections when needed.

• **Directorate Analysis.** It is here that P&G fares worst. While conceding that the present board is excellent, and conforms to most of its principles, the Institute feels that company policy could be better attuned to the public interest with a different board composition.

AIM feels the board is a little too old (60 years average), a little too "inside" (10 "inside" and actually only 6 "outside"), and definitely too "Cincinnati." While the company is in 17 states, at 35 different localities, all the directors and company officers are residents of Cincinnati. The result is a definite weakness in community relations, particularly in the matter of donations and contributions, which are much lower than allowed, and concentrated in Cincinnati.

• **Fiscal Policies.** While these are in the main well handled, the Institute did find a present situation in which liabilities exceed liquid assets by more than $15 million. This is, apparently, temporary and came about largely from money spent on a new Florida project and on the bumper cotton crop.

• **Production Efficiency.** P&G rates very high here, and particular praise is given to the company's labor relations, which has largely contributed to the average productivity rise of 3% per year. This category rates high in the Institute's scoring, since it feels that worker morale is a fundamental factor that is possibly the most neglected by management.

• **Sales Vigor.** P&G spent $37 million for advertising during 1950. This is the second highest of the 298 excellently managed companies, and the effective way it was used rates P&G an almost perfect score for sales vigor. Here the Institute gives a nod to the company's rapid rise in the home-permanent field *(CW, Jan. 26)*, while noting that Colgate-Palmolive-Peet has it licked so far in the drug-store trade.

• **Evaluation of Executive.** Here P&G made a perfect score.

With these ten categories, the Institute feels it gives the necessary weight to all important functions of management. Even in a company as well managed as P&G there are weak spots, some of which seem almost impossible in view of good spots elsewhere. For example, P&G is very good in its labor-employee relations, but weak on some community relations, and not outstanding in matters of public relations—all closely related subjects.

**Ever-Increasing Efficiency:** It is these weak spots that the Institute was founded to combat. Martindell feels that if we are to go ahead in our system we must have an ever-increasing efficiency of management.

With an addition over 1950, of 55 firms among the excellently managed companies, Martindell sees some of his ideas taking root, and the work of the Institute bearing the desired fruit.

On the sound theory that awareness is half the fight, Martindell is planning to continue the task of classifying management on a merit basis, and of identifying the men responsible for management excellence.

For the future, the Institute is setting one of its guns on the danger of "corporatism," or the exercising of economic authority without accompanying public responsibility. This leads to the average employee's having little or no sense of being part of an organization, and consequently very low morale. This, the Institute feels, is the most dangerous management tendency of our times.

## Built By Chemicals

**From a population of 400 to one of 20,000 in ten years is the prediction for Calvert City, the newest city in Kentucky. Reason: The chemical industry has moved into the area and the boom is on.**

Already the four chemical companies in the area—Pittsburgh Metallurgical Co., Pennsylvania Salt Manufacturing Co., National Carbide Division of Air Reduction Co., and B. F. Goodrich Chemical Co.—have put up $20,000 to see the fledgling city through its first year.

Each of the participating companies pledged up to $5,000 to the civic-minded citizens and officials of the new city. Half is for launching a municipality, the other half will be used after community-development plans are completed.

**Chemical Center:** The chemical companies' belief in the potentialities of the area is plain in their willingness to underwrite the immediate future, and leaders in the industrial development program in Kentucky have predicted that Calvert City will become the chemical products center of the South in the next decade.

For the companies that have selected the area as the site of their new plants, the donations amount to the first step in setting a solid foundation under present and future community relations. A clean, safe, and well-managed city is vital in keeping the community on a stable basis, and

**PENNSALT'S TOMLINSON: Industry's "midwife" to Calvert City.**

a stable community with satisfied citizens is an asset to any factory in the area.

**Trustees Move Ahead:** The city was incorporated as a sixth-class city last November, and the board of trustees, governing the city until the next regular election, has already set up a budget for the first fiscal year. In July they will begin levying taxes, but little revenue is expected before the end of the year. In the interim, the chemical companies' $20,000 will see the city through its infant stages.

With the help of James Bonner, member of the Kentucky Agriculture and Industrial Development Board, and under the watchful eye of R. W. Tomlinson, Pennsalt plant manager, the board is going ahead at its immediate tasks. High on the list: Establishing municipal offices; setting up regulations for subdivisions, safety and sanitation; adopting a planning and zoning ordinance; building a

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CAUSTIC SODA • CHLORINATED PARAFFIN • CHLOROBENZENE • CHLOROTOLUENE • CYCLOHEXANOL • MURIATIC ACID • SULFUR CHLORIDE

municipal water works; constructing streets.

Tomlinson keeps a weather eye on the board's actions in his position as contact man between industry and the city; one of his duties is to pass on day-to-day revisions in the municipal budget. This does not imply any strings on the $20,000 except that the companies want to be assured that the money is spent wisely.

**Master Plan:** The trustees expect to complete their master plan for the city's future, including the financial structure, within three months. After that they will solve the zoning and annexation problems, probably in less than five months.

Bonner points out that the contributions from the chemical companies would enable the city to complete its organization and planning stage, and that by next year Calvert City will be on its own "financial feet," ready to move ahead toward its goal of 20,000 population and the creation of the chemical center of the South.

## LEGAL . . . . . .

**Government Settles:** Arthur D. Little, Inc. has settled it $1.5 million claim against the U.S. Government. Suit was originally started in the Court of Claims on Nov. 22, 1950, for damages for alleged unauthorized use of certain of the company's vapor compression distillation patents.

The patents involved cover equipment for manufacturing potable water from sea or polluted water sources. They were granted to the company while it was doing development work on mobile compression distillation units for the Government.

Government liability for patent infringement was released and the complaint dismissed in consideration of payment by certain Government contractors who had made the equipment. For a lump sum payment from the Government, the company then granted it an irrevocable royalty-free license for the life of the patents.

•

**Injunction Asked:** A Baltimore Federal court has been asked to grant a declaratory decree and a restraining injunction against Mathieson Chemical Corp. in a contract dispute with Activated Alum Corp. The Alum company is seeking enforcement of its contract for sulfuric acid made with Mathieson's predecessor, Standard Wholesale Phosphate and Acid Works, and alleges that grave health problems would arise if its supply of acid was cut short.

•

**Air-Pollution Curb:** A 30-page air-pollution control bill is ready to be introduced into the Kentucky legislature. Drawn up by Louisville-Jefferson County interests, the bill would apply to the whole state, but is actually designed to solve the long-standing smoke and dust problem in Louisville's West End.

The bill is comprehensive, calling for a control board in each county, which will hold public hearings on all disputes and complaints, and provides for punishment in the form of fines for violators.

## EXPANSION . . .

**Wood Pulp:** Two new Canadian pulp plants, and expansion of a third were in the news this week.

Beverly Pulp & Paper Mills, Ltd., will construct pulp and paper mill facilities on the eastern outskirts of Edmonton, Alberta.

The newly formed Kootenay Forest Products, Ltd., will build a $20 million pulp mill at Nelson, B. C. According to plans, the plant will produce 200 tons per day.

Celanese subsidiary Columbia Cellulose (*CW, Feb. 9*) will increase high alpha pulp production from 200 to 300 tons daily. In addition to installation of new equipment, present facilities are being altered to increase production.

•

**Fluorspar:** Reynolds Mining and Kaiser Aluminum have both purchased fluorspar mines during past weeks. Reynolds acquired the Poncha Springs fluorspar mine in Colorado from Fluorspar, Inc.; and Kaiser, the Baxter mine near Fallon, Nev., from H. W. Gould & Co., San Francisco.

Incidentally, Reynolds Aluminum will build a $30 million aluminum plant at Gum Springs, Ark., about 45 miles from Hurricane Creek, Ark., where it manufactures synthetic cryolite from fluorspar.

•

**Tungsten Ore:** Vitro Chemical Co. may add facilities for tungsten ore processing to its present uranium enrichment plant in Salt Lake City. The plant would enable upgrading of Western-mined ore to meet specifications of the Government stockpile.

•

**Sulfuric Acid:** Bunker Hill & Sullivan is considering erection of a sulfuric acid plant at its Kellogg, Idaho, smelter. Capacity would be 250-300 tons per day. Company officials, who recently visited several other sulfur recovery installations in the area, are still wary of the project due to post-mobilization demand factors.

Completion date of October, 1952, has been set for Consolidated Chemical Industries' new acid plant at Baton Rouge. The plant will produce 400 tons per day of water white sulfuric from refinery sludge, obtained principally from refineries in Baton Rouge and New Orleans, and is said to be largest regeneration plant in the world.

•

**Merck:** The company's second manufacturing plant in the South will be constructed near Albany, Ga., on a 640-acre site. Production is scheduled to begin before the start of 1953.

•

**Standard of California:** The company proposed to spend $90 million during 1952 for new petrochemical and cat cracking facilities.

## Union Hassle

**District 50—United Mine Workers has a big grin these days, and a solid election victory to back up its claim that it doesn't need NLRB's blessing to organize workers. Reason: District 50 local at Wyandotte Chemical handily beat off a raid by what it termed "the whole CIO." The vote: CIO, 711, No Union,* 1766.**

The District 50 claim to have beaten "the whole CIO," while a slight exaggeration, is not as far from the truth as might be expected. Involved in the union-union battle on the CIO side were the Oilworkers, Chemical Workers, Michigan State CIO, and the Auto Workers. All four had been signing up workers, but decided to pool their efforts and decide jurisdiction later. Now that won't be necessary with District 50 still in complete charge.

**CIO Rivalry:** Behind the District 50-CIO squabble there is also an obvious inter-CIO struggle. Apparently the whole thing started when some dissident workers at Wyandotte came to the CIO and asked for help in throwing out District 50. Then the fun began as CIO unions vied to do the throwing.

From here on the story becomes entangled in conflicting reports. District 50 says the Oilworkers moved in first, backed by a $50,000 donation from the Auto Workers; but CIO Chemical Workers says it was there first and the Oilworkers horned in. This much is certain: Both CIO unions were signing up workers. The Chemical Workers has been organizing the whole area for some time, was quietly going about the job when the Oilworkers

* District 50 is not allowed to use the machinery of the NLRB since the UMW leaders have not signed non-communist affidavits as required by Taft-Hartley, therefore a vote for "No Union" is essentially a vote for District 50 in cases where it is involved.

forced everyone's hand by bringing the fight into the open.

Once this had happened it soon became obvious that more CIO help was going to be needed—even to the point of calling in the all-powerful Auto Workers themselves. It was then that the decision was made to group them all together and have the ballot read simply, CIO and No Union. The Chemical Workers, however, in spite of the compromise, makes no bones about its opinion that the election was badly mistimed and obviously premature.

**Jurisdiction:** Even farther behind the scenes in this situation is the evidence of growing rivalry and animosity between the Oilworkers and the Chemical Workers within the CIO. Michigan is sacred territory to the Chemical Workers—it undoubtedly has it marked as one of its main targets in the new organizing drive (*CW, Feb.* 9)—and it is not likely to brook the Oilworkers invasion there. It could be the straw that will break the camel's back, start open hostility.

Meanwhile District 50 is crowing lustily, reiterating its defiance of the NLRB, CIO, and everyone else, and winning elections without benefit of having its name on a ballot.

•

**Schwartz Laboratories:** The New York City and Mount Vernon, N.Y., plants of Schwartz Laboratories, research and advisory chemists for the food and beverage industries, have signed a new contract with their CIO Chemical Workers local. The new one-year contract provides an across-the-board wage increase of 7½¢ an hour, three weeks' vacation after five or more years of service, and a wage reopener based on the BLS cost-of-living index.

•

**Misunderstanding:** A one-day picketing at the Philadelphia plant of the Atlantic Refining Co., was halted when the Tide Water Associated Oil Co.'s employees, who are on strike, learned that the plant did not serve Tide Water customers. Atlantic called it all a "misunderstanding."

•

**Best Since War:** 1951 saw a 40% drop in idleness due to strikes, and no nation-wide or industry-wide stoppages of long duration. Only 21 large strikes occurred, and of these only two, both in the textile industry, lost more than a million man days.

Wages, and closely related matters, were the dominant issues in most of the large strikes, as they were in nearly 50% of all 1951 disputes. Union shop, union recognition, and other union security issues were of major importance in about 20% of the year's strikes. Jurisdictional, rival union, and sympathy strikes together accounted for less than 6% of all stoppages, and caused only some 3% of the year's total idleness.

## FOREIGN

**Pyrites:** Sulfur-bearing pyrites have been discovered in the Cuddapah district of India. They are believed to be superior to any other such Indian deposits discovered to date, will be funneled into fertilizer production.

•

**Yugoslavian Expansion:** Loans made by the International Bank for Reconstruction and Development will enable Yugoslavia to construct two plants for the production of salt, soda ash, caustic soda, and chloride. While part of the output may be exported at the outset, most of it will be required to meet growing requirements of the glass, paper, pulp, and textiles industries.

•

**British Exports:** The United States was Britain's second best customer for chemicals in 1951. It purchased $31.6 million in chemical exports, was nosed out of first place by India which bought $32.3 million worth. Total British chemical exports topped $399.5 million, included drugs and medicinals ($92.1 million), alkalis ($25.2 million), disinfectants, insecticides, and allied products ($24.9 million), and ready-mixed paints ($16.8 million).

•

**Fluorescent Dyes:** Farbenfabriken Bayer of Leverkusen, Germany has recently begun marketing three new dyestuffs (red, green, and yellow) which fluoresce strongly in both ultraviolet and daylight. They are said to give greater brilliancy than ordinary fluorescent pigments, but to be without outstanding light-fastness.

•

**p-Amino-Salicylic Acid:** Italy is now producing p-amino-salicylic acid at the rate of 50 tons per month. Most of this is for export.

•

**Atomic Pile:** Plans for the construction of an atomic pile—India's first—are now under way. To be used for the production of isotopes as well as for experimental purposes, the pile is to be located in Southern India near the Travancore coast where large deposits of monazite sand (a rich source of thorium and uranium) are situated.

•

**Rayon:** American Viscose Co., said to be planning heavy capital investments in one of Colombia's largest rayon factories, Indurayon Barranquilla, will also take over technical direction of the firm.

## KEY CHANGES

**Thomas McCance:** To director, Union Sulfur and Oil Corp.

**William J. Wiley:** From vice president in charge of production, Stephen F. Whitman & Son, to director and financial vice president, Atlas Powder Co.

**Bradley Dewey:** To director, W. R. Grace & Co.

**Reed O. Hunt:** From assistant general manager of manufacturing, to vice president, Crown Zellerbach Corp.

**H. D. McKay:** From general manager and chairman of the boards of Prince Matchabelli, Inc., and Alfred D. McKelvy Co., Vick Chemical Co. subsidiaries, to independent management consultant.

**H. R. Marschalk:** To vice president, Vick Chemical Co.

**Robert L. Taylor:** From executive vice president, Manufacturing Chemists' Assn. to vice president, Hill & Knowlton, Inc.

**William B. Baker:** To director of product development, The Armour Labs.

**B. E. Thomas:** From production manager to director of foreign manufacture, Monsanto Chemical Co.

**Jack C. Dart:** From director to manager of research and development, Houdry Process Corp.

**Alex G. Oblad:** To associate manager, research and development, Houdry Process Corp.

**Arthur W. Johnston:** To sales manager, Niagara Filter Corp.

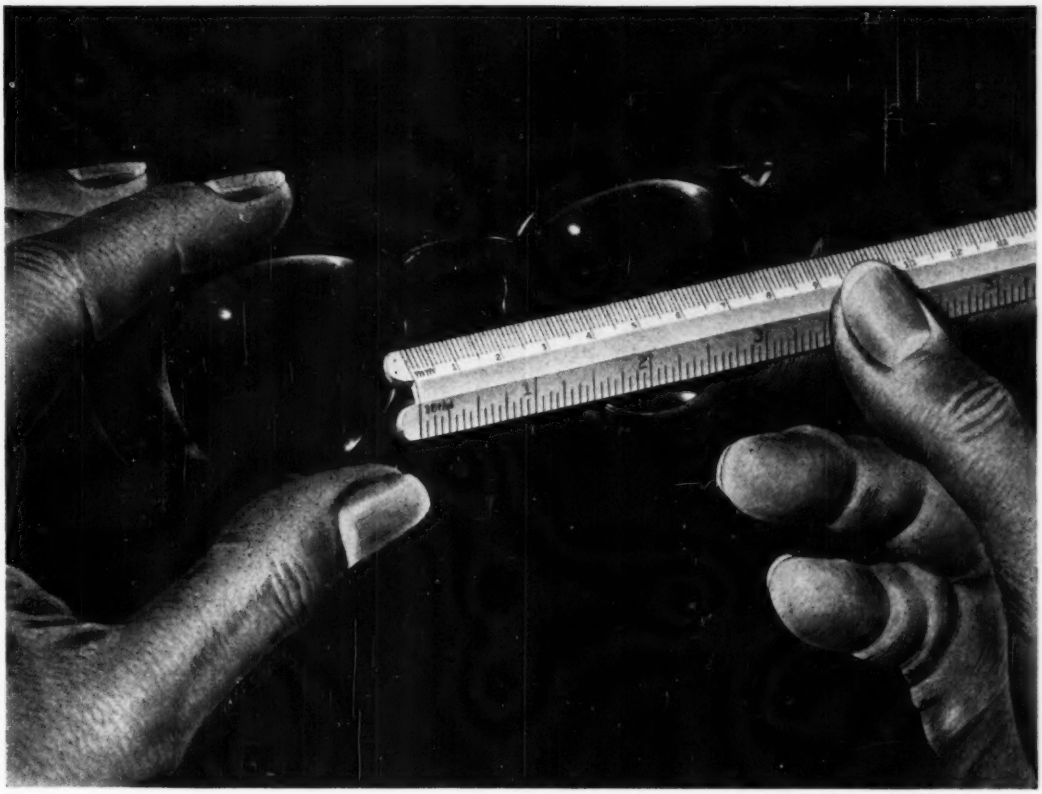
**Louis F. Weyand:** From vice president and member of board to executive president, Minnesota Mining & Mfg. Co.

**Robert H. Helle:** To technical superintendent, Acrilan plant, The Chemstrand Corp.

**William M. Cook Jr.:** From assistant product manager, Sofskin Co., a subsidiary of Vick Chemical Co., to manager, Canadian operations, Vick Chemical Co.

## DIED

**Morris E. Leeds:** Founder and chairman of the board of Leeds & Northrup, at Lake Wales, Fla. He was 82.



*Optician's Rule made by Sadler Brothers, Inc., S. Attleboro, Massachusetts*

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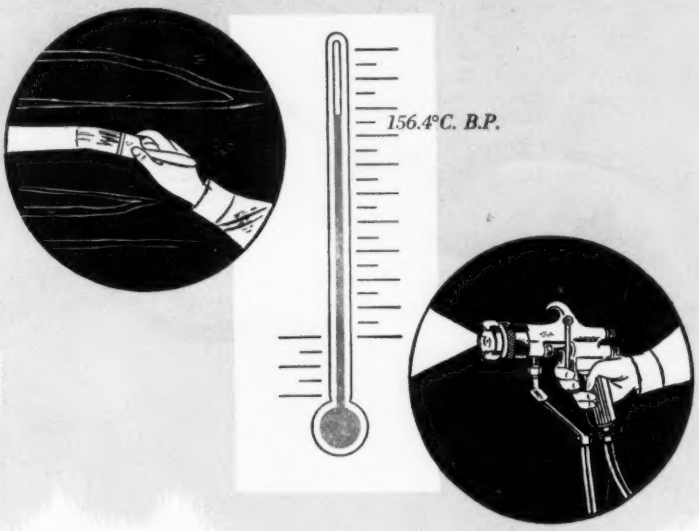
## To make a better lacquer you need a better solvent

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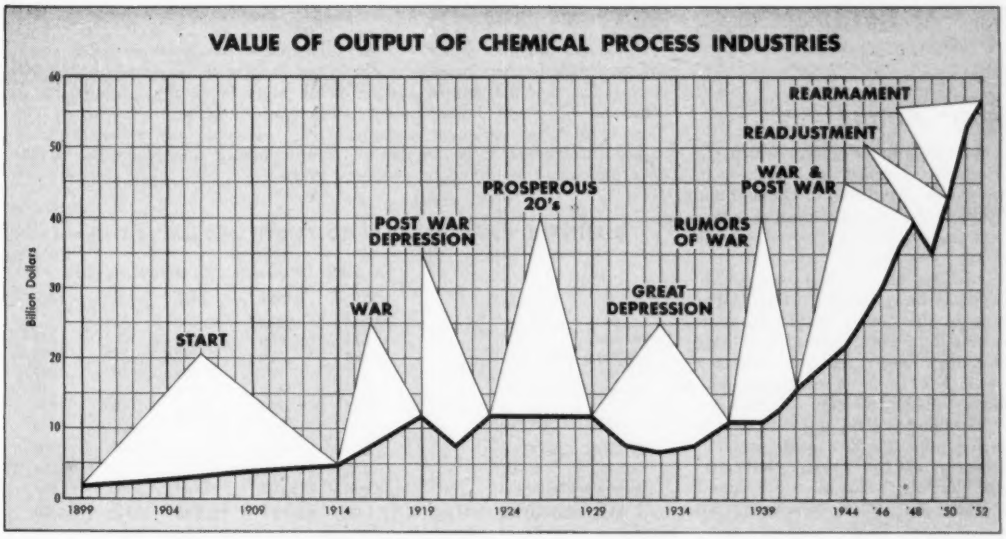
*Physical Properties of "CELLOSOLVE" ACETATE*

FORMULA $CH_3COOC_2H_4OC_2H_5$

| | |
|---|---|
| Molecular Weight | 132.16 |
| Specific Gravity | 0.9748 |
| Boiling Point, °C. at 760 mm. Hg | 156.4 |
| Vapor Pressure, mm. Hg at 20° C. | 1.2 |
| Flash Point, °F. (Cleveland Open Cup) | 150 |

*The term "Cellosolve" is a registered trade-mark of Union Carbide and Carbon Corporation.*




# Solid Basis Underlies Expansion

High defense needs, continually burgeoning civilian markets firmly underwrite the chemical process industries' rapid growth.

Industry's tenative plans point to a healthy expansion rate over the next three years—as far ahead as estimates are at all valid.

But there are caution signs, some rough spots in the road: insufficient steel for construction, depletion of low-cost raw material sources, diversion of natural gas to domestic heating, the Government's fiscal policies.

**During the recent past** the chemical process industries have started to restore order out of the supply-and-demand jumble that ensued immediately after the beginning of the Korean war.

At that time, a minor boom was in the making, and the start of open hostilities shoved the need for chemicals to the sky. It is only recently that the demand for certain chemical products has started to come down off the Korea-built "skyhooks."

## IMPACT OF WAR

**Wars**—even small ones—create pressure where none existed before. But, on the profit side of the ledger, armed conflict reduces the demand for many chemicals that are not required by military exploits.

**Debit Column:** Expansion of the synthetic rubber industry required huge quantities of ethyl alcohol to provide an adequate supply of butadiene. Result: an inflated demand and a sizable price increase.

To satisfy the huge requirements by the synthetic rubber industry, large quantities of alcohol were imported, principally from France, and huge stocks built up in the United States. But recently (*CW, Jan. 19*) these stocks reached the point at which the 90¢-a-gallon price tag could be reduced to a more satisfying—to the customer—75¢ a gallon.

Moreover, a further price cut will undoubtedly come when the now-building plants for synthesis of alcohol from ethylene come on stream. These plants should be just about enough to satisfy the "normal" (non-butadiene) demand. This production, together with the huge stocks now on hand, should bring the future price into line with that which still obtains for the synthetic product—about 55¢ a gallon.

**Credit Column:** On the credit side of the ledger, wartime curbs on consumer loans and, more recently, material shortages have put an effective damper on demand for chemicals required in home construction. This, plus the cut-back in automobile production (military items require less paint per pound of steel) has greatly improved the paint supply situation.

But paint supply improvement does not necessarily mean an improvement in the supply of all chemicals used in paints. For example, phthalic anhydride, required for production of the alkyd resin components of paint, is

now going into dibutyl phthalate, which is a plasticizer for extrusion and forming of rocket propellent powders.

## PROFIT PICTURE

**The background against which** the current scene must be sketched, in two words, is *inflation* of demand and *deflation* of profits as a result of higher costs and ballooning Federal income taxes.

Inflation of demand is readily measured in terms of the total dollar value of the output of the chemical process industries. CHEMICAL WEEK's estimates indicate that this increased about 20% from an estimated 43.7 billion dollars in 1950 to approximately 53 billion dollars in 1951. If it is assumed that the armament program continues at the present indicated pace, the dollar value of output should be about 57 billion dollars for the calendar year 1952.

Such an increase in sales normally strikes joy to the company treasurer's heart. However, at the present time, he is more than satisfied if he can hold profits at the present level. Uncle Sam is in a taking mood—in two ways: First, most of the increased sales are accounted for by the armament program; the increased chemical output will find itself, either directly or indirectly, sold to Uncle Sam. Second, by means of the excess profits tax, the Government is taking most of the normally expectable profit increase.

**True Measure:** Although dollars are representative of total output, they are not a measure of the actual physical volume of goods produced; the latter is the true measure of production expansion. The difference between the two is graphically portrayed in the accompanying chart (p. 24) showing the Bureau of Labor Statistics' Index of wholesale chemical prices, along with CHEMICAL WEEK's Index of Chemical Output. (The latter is prepared by adding a productivity factor to the total number of hours worked, and is an output indicator which is relatively free from the dollar sign.) Thus, the varying difference between the two curves provides a measure of the price inflation contributing to the total dollar value of chemical process industries output.

Prices started in 1948 at a relatively high level, and under the influence of a noticeable lack of demand in 1949, as indicated on the output index, slid to an extremely low level. But only a hint from Korea was needed to push the price index to new high levels, to be followed shortly at these high levels by a rise in actual physical output.

It is questionable whether there will be much further increase in the price index, now that supply and demand are in much better balance. Thus there is no particular pressure to bring about the large number of price increases that would be needed to show any major effect on the price index.

This is not so true of the output index. More and more new facilities are being brought in all the time, and the addition of their output to present production should cause a gradual and continued rise over at least the next two years.

## EXPANSION

Recently the Defense Production Administration tabulated the value-in-place of facilities covered by certificates of necessity. It was estimated that by December 31, 1951 at least 60% of the estimated value of certified facilities for industrial organic chemicals would be installed—one of the highest of all classifications. On the other hand the programs for industrial inorganic chemicals (principally ammonia and chlorine plants) and synthetic fibers have the farthest to go.

Of the eight categories which can be classified as chemical process industries, DPA has estimated that nearly a third of the certified plants were in place by December 31, 1951. There are chemical process industries plants in other categories, but inasmuch as they represent the minor portion of the total, these groupings have been omitted from the tabulation. Thus, the figures in the tabulation represent a minimum value of certified chemical process industries installations.

Moreover, there are a few uncertified chemical process industries installations, e.g., Solvay's soda ash

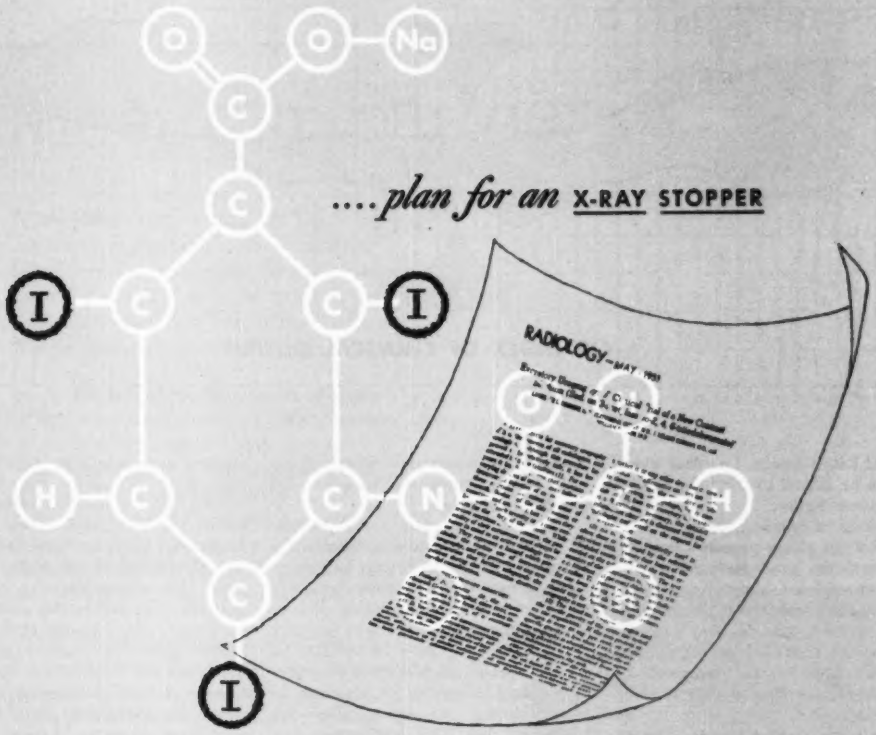
### BUSINESS CAPITAL EXPENDITURES (Millions of Dollars)

| | Actual | Planned | Preliminary Plans | | |
|---|---|---|---|---|---|
| | 1951* | 1952 | 1953 | 1954 | 1955 |
| Steel | 1,310 | 1,638 | 1,048 | 934 | 901 |
| Machinery | 638 | 636 | 443 | 424 | 414 |
| Electrical Machinery | 355 | 809 | 712 | 372 | 299 |
| Autos (including defense) | 797 | 781 | 406 | 297 | 289 |
| Transport Equipment | 227 | 404 | 145 | 40 | 40 |
| Food | 930 | 769 | 710 | 816 | 754 |
| Petroleum & Coal Products | 2,040 | 2,815 | 2,477 | 2,111 | 2,055 |
| **CHEMICALS** | **1,266** | **1,464** | **1,323** | **1,191** | **1,179** |
| Textiles | 676 | 396 | 396 | 383 | 394 |
| Other Manufacturing | 2,902 | 3,209 | 2,368 | 1,957 | 1,869 |
| **ALL MANUFACTURING** | **11,141** | **12,921** | **10,028** | **8,525** | **8,194** |
| Mining | 806 | 943 | 415 | 321 | 358 |
| Railroads | 1,564 | 1,642 | 1,248 | 1,117 | 1,002 |
| Electric & Gas Utilities ** | 3,676 | 3,948 | 3,360 | 3,204 | 2,748 |
| Other Transportation & Communications | 1,592 | 1,721 | 1,671 | 1,943 | 1,839 |
| **ALL INDUSTRY** | **18,779** | **21,175** | **16,722** | **15,110** | **14,141** |

* U.S. Dept. of Commerce
** Electrical World, American Gas Assn.

### WHAT COMPANIES ARE SPENDING FOR

| | 1951 | | 1952 | |
|---|---|---|---|---|
| | Expansion | Modernization | Expansion | Modernization |
| | % | % | % | % |
| Steel | 67 | 33 | 56 | 44 |
| Machinery | 56 | 44 | 54 | 46 |
| Electrical Machinery | 49 | 51 | 67 | 33 |
| Autos | 73 | 27 | 73 | 27 |
| Transport Equipment | 77 | 23 | 90 | 10 |
| Food | 41 | 59 | 24 | 76 |
| **CHEMICALS** | **77** | **23** | **78** | **22** |
| Petroleum & Coal Products | 32 | 68 | 32 | 68 |
| Textiles | 43 | 57 | 24 | 76 |
| Other Manufacturing | 48 | 52 | 53 | 47 |
| **ALL MANUFACTURING** | **53** | **47** | **52** | **48** |

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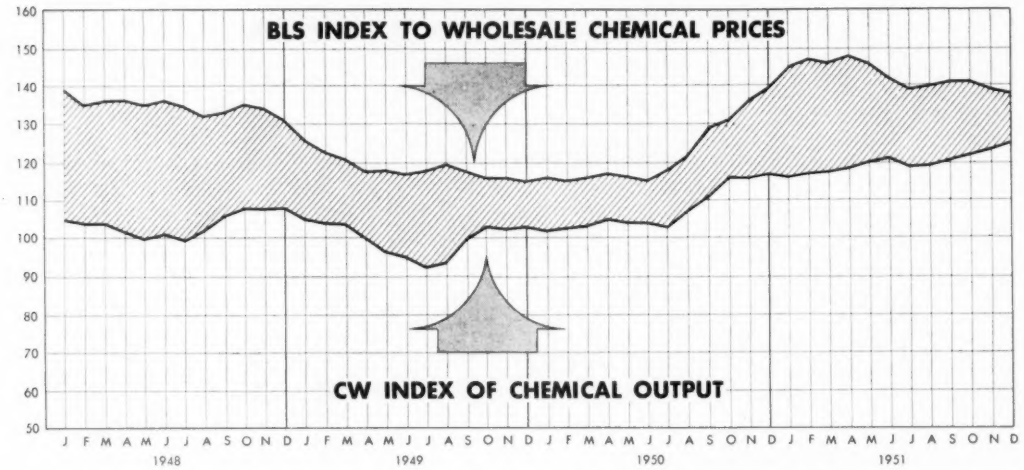



plant at Baton Rouge, La., that would have to be added to the total to give a complete figure. In any event the $1.7 billion of certified chemical process industries plants promises continually increasing production for a long period to come.

Even more significant than what has happened, and what is happening, are the chemical industry's own plans for the future as revealed by McGraw-Hill's annual survey of manufacturing.

Only a slight let-up from the current breakneck pace is in the cards: Capital expenditures this year will hit an estimated total of $1,464 million, as compared with $1,266 million last year. But in 1953, 1954 and 1955, current thinking calls for an additional $1,323 million, $1,191 million and $1,179 million, respectively (*see cover*). This year's $1½ billion will add 10% to physical production capacity. Assuming that the current ration of expansion to modernization (77:23) holds for the next three years' capital outlay, capacity by the end of 1955 should be half again as great as it was in December, 1950.

The impact of excess profits taxes on a growth industry is revealed by management's plans for financing expansion. Compared with all manufacturing firms, a lower proportion of chemical companies can count on retained earnings; a higher proportion must borrow or issue new stock (*see tables on p. 28.*)

**Stalled by Steel:** But for the problem of getting adequate supplies of structural steel, the program of new plant construction for the new process industries would have been much further advanced. Up until recently, the chemical industry as such was low man on the totem pole when allocations for structural steel were handed out in Washington.

This situation gives some promise of improvement; but even now some branches of the industry have discovered one way to assure the availability of steel: Find a method of augmenting the nation's uranium supplies by recovering it as a by-product of regular operations. A current example: By-product recovery of uranium in manufacturing superphosphates for fertilizer. But NPA spokesmen say that the chemical industry, on the basis of the need for new production alone, should receive increasingly favorable attention (*CW, Jan. 5*) at the hands of Washington steel allocators.

Any scheme that has shown promise of increased sulfur recovery has always received priority treatment by Washington, and will continue to receive favorable attention until the severe shortage is relieved.

A short time ago, manufacture of benzene rated alongside sulfur production as a means of getting favorable steel allocations. But now, the several large benzene-from-petroleum plants are well under way and are beginning to come into production. Completion of these units will relieve U.S. dependence on imported benzene; but before the plants come on stream, there is expected to be a severe strain on benzene supply as importers try to stop the flow from Europe at the same time as—or somewhat before—the flow starts from the petroleum refineries. If timed properly, little trouble can be expected, but there are indications that imports may be stopped too soon.

**INDEXES OF PHYSICAL CAPACITY**
**(Dec. 1950 = 100)**

| | Dec. 1951 | Planned for 1952 |
|---|---|---|
| Steel | 103 | 112 |
| Machinery | 115 | 130 |
| Electrical Machinery | 109 | 124 |
| Autos | 111 | 120 |
| Transport Equipment | 114 | 152 |
| Food | 106 | 109 |
| **CHEMICALS** | **110** | **122** |
| Petroleum & Coal Products | 104 | 108 |
| Textiles | 105 | 108 |
| Other Manufacturing | 106 | 112 |
| **ALL MANUFACTURING** | **107** | **116** |

## PETROCHEMICALS

Manufacture of benzene, heretofore solely a coal-tar product, from petroleum, draws attention to petrochemicals, perhaps the most notable field of expansion in the chemical industries. And most of this has been on the Texas and Louisiana Gulf Coast. Reason: An enormous supply of low-cost natural gas, salt, sulfur, space to expand, and a favorable climate. Difficulty: A long-distance haul from the large, primary Eastern market.

Although the chemical industry will probably continue to expand in this area, the high cost of transporting inherently low-cost products is already causing the industry to study its freighting and barging bills.

**More Than Scrutiny:** Mathieson Chemical Corp., for one, has done more than scrutinize its bills. It has backed an interesting new development in which the huge natural gas pipeline of Tennessee Gas and Transmission Co. is used to carry petrochemical raw materials to a point

# meet our partner

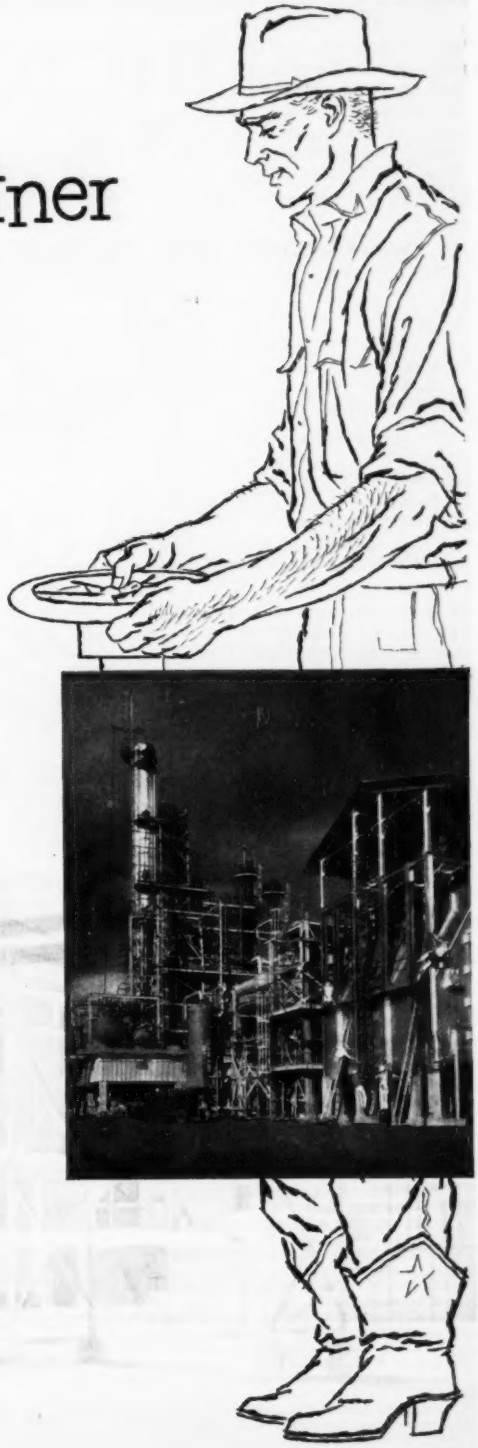
A few weeks ago, a long, tall Texan opened a valve in a pipeline on the outskirts of Longview, Texas. The whistle of the gas, as it started through that valve, marked the opening of a new division of the Eastman Kodak Company—Texas Eastman Company.

At the far end of the pipeline is a supply of gas from the greatest proven reserve of any oil field in the United States—the great East Texas Field. At the Longview end—the new Eastman chemical plant which will convert the natural gas and propane into potentially hundreds of chemicals vital to the production of textiles, plastics, lacquers and safety glass, to name but a few.

Texas Eastman is a separate division of Eastman Kodak Company. All of its products, however, will either be used by or sold through Tennessee Eastman Company. For the most part, these products will provide Tennessee Eastman with an economical source of raw materials for the manufacture of Tenite plastics, Eastman acetate yarns and fibers and the constantly expanding group of Eastman Industrial Chemicals.

▼

We are proud of our unbroken production record, and proud of our reputation for dependability. In a large sense, it is because of this pride that Texas Eastman Company has been built. For in so doing, we have assured ourselves of an uninterrupted flow of economical raw materials—and the supply of raw materials is the foundation of dependability.



**Tennessee Eastman Company**
Division of Eastman Kodak Company,
**KINGSPORT, TENNESSEE**

nearer the market. Near Brandenburg, Ky., the raw materials are separated from the gas and used for chemical manufacture. The Kentucky location is much closer than Texas to the major chemical markets in the Middle West and in the Northeast.

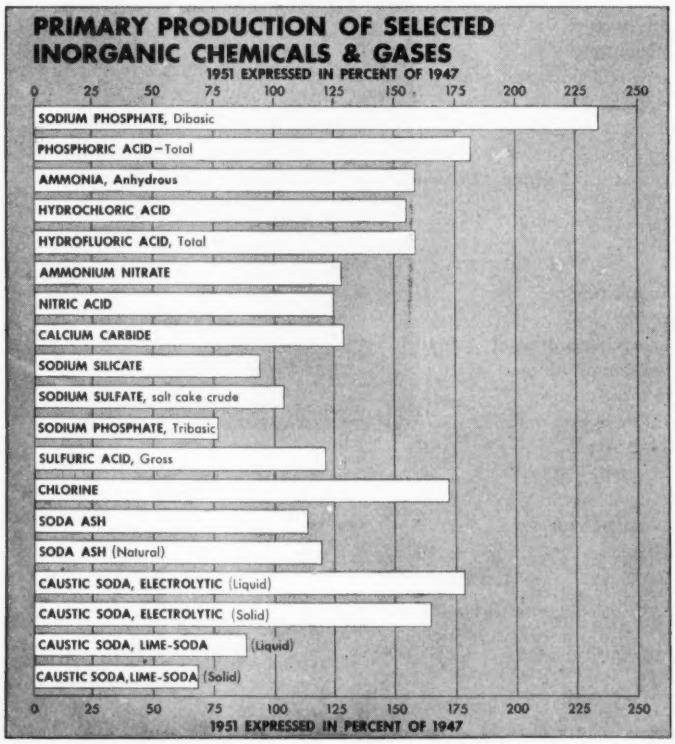
Mathieson uses the ethane content of the gas to produce ethylene glycol and ethylene oxide. At the same time that the ethane is separated, propane and butane are also recovered. These are liquified and sold as cylinder LPG in the vicinity of the plant.

Another company has decided that the Mathieson scheme will save money. National Petro Chemical Co. is carrying out a similar project at Tuscola, Ill., for the production of ethyl chloride and ethyl alcohol. Very possibly this trend is the next major development in petrochemicals.

**Danger Ahead:** One major difficulty with a scheme of this type is that a multi-million dollar plant is linked to its raw material supply by a pipeline which is supplying natural gas for domestic fuel.

## WHAT'S BEHIND 1953-1955 INVESTMENT PLANS?

| | Percent of companies saying: | | | |
|---|---|---|---|---|
| | More Capacity for present products | Capacity for new products | Plants to serve new market areas | Replacement & Modernization |
| Steel | 38 | | | 88 |
| Machinery | 39 | 31 | 4 | 87 |
| Electrical Machinery | 57 | 71 | 14 | 100 |
| Autos | 67 | 33 | 33 | 83 |
| Transport Equipment | 57 | 43 | 14 | 71 |
| Food | 50 | 21 | 17 | 88 |
| **CHEMICALS** | **60** | **60** | **27** | **47** |
| Textiles | 16 | 26 | 5 | 89 |
| Other Manufacturing | 49 | 38 | 11 | 91 |
| **ALL MANUFACTURING** | **48** | **33** | **13** | **83** |


PRIMARY PRODUCTION OF SELECTED INORGANIC CHEMICALS & GASES
1951 EXPRESSED IN PERCENT OF 1947
0 25 50 75 100 125 150 175 200 225 250
SODIUM PHOSPHATE, Dibasic
PHOSPHORIC ACID—Total
AMMONIA, Anhydrous
HYDROCHLORIC ACID
HYDROFLUORIC ACID, Total
AMMONIUM NITRATE
NITRIC ACID
CALCIUM CARBIDE
SODIUM SILICATE
SODIUM SULFATE, salt cake crude
SODIUM PHOSPHATE, Tribasic
SULFURIC ACID, Gross
CHLORINE
SODA ASH
SODA ASH (Natural)
CAUSTIC SODA, ELECTROLYTIC (Liquid)
CAUSTIC SODA, ELECTROLYTIC (Solid)
CAUSTIC SODA, LIME-SODA (Liquid)
CAUSTIC SODA, LIME-SODA (Solid)
0 25 50 75 100 125 150 175 200 225 250
1951 EXPRESSED IN PERCENT OF 1947

But the Federal Power Commission has decided that use of natural gas for domestic fuel has a higher priority rating than its use for industrial purposes. Thus, as Du Pont found at Sabine River, Texas, there is always the possibility of receiving an order to shut down the plant in the cold season to conserve the gas supply for home heating. There is little recourse from such an order, and a few days' shutdown of a high-capital-cost plant can well spell the difference between good profit and break-even—or even losing—operation.

The skyrocketing use of natural gas for domestic fuel bears further examination. Continuous expansion at the current rate—and there is every promise of such continuance—could well raise natural gas consumption to the point where little is left for conversion to chemicals.

Further, when natural gas is used as domestic fuel it can command a much higher price than chemical manufacturers can afford to pay; and in the long run, unless protected by complete ownership of a single gas field, petrochemical producers will be faced with gradually increasing natural gas costs. Thus, the next decade may well see the chemical industry return to dependence on coal as a source of carbon for chemical synthesis, reversing the trend of the past ten years.

It is impossible to say just when this will occur, but there is little question that it will. Those who plan their plants so that they can be readily converted to coal may well be those who make money out of petrochemical production over the long haul.

**Technology Shifting Too:** The decline of natural gas is not the only factor in this probable shift: It is being abetted by technological advances.

In an area that is surrounded by natural gas fields, in Milam County, Texas, Aluminum Co. of America has decided that very soon it will be cheaper to generate electric power from lignite than from the ever-more-costly natural gas.

Taken alone, this is an interesting fact, but a more significant aspect of the project are the additional plans: Eventually the plant is to carbonize the lignite, burning only the char under the boilers. Already, in England, hydrogenation of the low-temperature tar, such as that which will be produced by Alcoa, provides an excellent source of aromatic chemicals. The process is utilized by Imperial Chemical Industries, Ltd.

But this is not the only attack on

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GC52-1

this problem. Carbide and Carbon Chemicals Co. will build a large-scale pilot plant at Institute, W. Va., to hydrogenate coal for manufacture of chemicals.

From one of these two sources—or one of several other processes that are now only in the large-scale laboratory testing stage—will emerge, in the future, not only aromatic chemicals, but some aliphatic chemicals as well. This is not to say that these plants will replace the huge investment the petroleum companies are now making in the production of aromatic chemicals. It probably won't. But most of the expansion required henceforth will probably be towards coal. Over the long run the petroleum refiners will probably be very appreciative of this change. The aromatic chemicals that they now extract from petroleum are extremely valuable in the production of high anti-knock motor fuel.

**At the Peak:** The petrochemical industry is now at the peak of its expansion rate. Within another decade it is quite probable that the only new petrochemical plants to be installed will be those which use olefinic hydrocarbons, such as ethylene and propylene, as raw material. These building blocks are not readily obtainable from coal by present technology. (But in a number of cases, e.g., production of ethylene glycol, alternative coal-based processes are available; and the increasing price of the natural gas or petroleum raw material will improve the economics of the coal-based processes.)

## *INORGANICS*

In the manufacture of inorganic chemicals, one question is dominant: "Where can I get more sulfur?"

It is extremely questionable whether any more domes of Frasch-minable sulfur with reserves equal to more than one year's supply will be found. Possible exception: In the Tehuantepec section of Mexico and off-shore areas in the Gulf off Texas and Louisiana. Any domes that are found in these locations, however, will be high-cost producers.

In Mexico, clearance of jungles and provision for transport to a point of shipment will hike costs. As for the offshore areas, it is hard to visualize a cheaply built sulfur mine installed where it would be exposed to the battering of the ocean waves.

Consequently, industry has been forced to turn to hydrogen sulfide (recovered from natural gas), pyrites, and anhydrites or gypsum to fill its needs. These, in practically all cases, will be high-cost sources. For the long run, these recourses spell only one thing—a price increase for sulfur, and for products that use sulfur in their preparation.

As shown on the chart on p. 26, probably the most striking increase, on a percentage basis, among the inorganics has been in the production of phosphoric acid and sodium phosphate. The 1951 output of phosphoric acid was at least 180% of the production in 1947—the best showing of any of the major chemicals which are charted. Another point of interest is the remarkable increase in the output of dibasic sodium phosphate, which has increased 234% above the 1947 level of production. This represents not only a sizable boost in the use of this particular sodium phosphate, but also a trend away from the use of such long-time favorites as trisodium phosphate, production of which is only about 75% of the 1947 level.

**Good Performer:** Chlorine is almost as good a performer as phosphoric acid. Before the end of 1952, it may show an even greater increase than phosphoric. Most of this rise is due to the terrific demand for chlorine as an intermediate in the synthesis of its multitudinous hydrocarbon derivatives.

The major problem here is to balance the demand for chlorine by an equivalent demand for caustic soda. As yet, the industry hasn't figured out how to do this. The cutback in production of lime-soda caustic is a partial solution; and although a further reduction will be evident this year, a complete solution to the problem can be worked out only over a long term.

Another good performer in the coming year will be anhydrous ammonia. New plants and operation of the Morgantown Ordnance Works will account for a sizable output boost. The need for nitrogen fertilizers, together with a rapidly increasing demand for nitrogen compounds by industry, will probably maintain pressure for some time to come.

The large dollar value of certified plants still to be constructed, the demand for "war" chemicals, and the continually increasing civilian market all promise continuance—for the predictable future—of the rapid expansion that the chemical industry has enjoyed over the past few years.

### WHERE THE MONEY WILL COME FROM—1952

| | Percent of Companies Planning to: | | |
|---|---|---|---|
| | Finance ENTIRELY from Profits and Reserves | Borrow Part of Funds | Sell Stock To Raise Part of Funds |
| Steel | 29 | 71 | |
| Machinery | 78 | 17 | 5 |
| Electrical Machinery | 89 | 11 | |
| Autos | 100 | | |
| Transport Equipment | 86 | 14 | |
| Food | 89 | 11 | |
| **CHEMICALS** | **67** | **22** | **11** |
| Petroleum and Coal Products | 75 | 25 | |
| Textiles | 86 | 14 | |
| Other Manufacturing | 83 | 14 | 3 |
| **ALL MANUFACTURING** | **80** | **17** | **3** |

### WHERE THE MONEY WILL COME FROM—1953-1955

| | Percent of Companies Planning to: | | |
|---|---|---|---|
| | Finance ENTIRELY from Profits and Reserves | Borrow Part of Funds | Sell Stock To Raise Part of Funds |
| Steel | 71 | 29 | |
| Machinery | 87 | 6 | 7 |
| Electrical Machinery | 86 | 14 | |
| Autos | 100 | | |
| Transport Equipment | 100 | | |
| Food | 91 | | 9 |
| **CHEMICALS** | **56** | **19** | **25** |
| Petroleum and Coal Products | 83 | 17 | |
| Textiles | 93 | 7 | |
| Other Manufacturing | 84 | 12 | 4 |
| **ALL MANUFACTURING** | **85** | **9** | **6** |

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RESEARCH . . . .

# New Naval Stores Boost

U.S. Department of Agriculture has just taken the wraps off 2½ years of terpene hydroperoxide research.

A new compound, pinane hydroperoxide, has been developed and a process devised for its commercial manufacture.

Catalyst for polymerizing cold rubber is its most promising use, but one that will take a good deal more evaluation.

**Hydroperoxides** are making chemical headlines. Several weeks ago (*CW, Jan. 26*) a new phenol process, based on the disproportionation of cumene hydroperoxide was the news. Now it's terpene hydroperoxides and their potential process uses.

Kicker for the latest flurry of hydroperoxide interest is a report of research at U.S. Department of Agriculture's Naval Stores Research Division, Olustee, Fla. In part, U.S.D.A. says that it has developed new chemicals from gum turpentine which show excellent promise as catalysts for the polymerization of cold synthetic rubber.

U.S.D.A.'s "new" chemicals are terpene hydroperoxides, menthane and pinane hydroperoxide to be exact. It's not surprising that they are suggested for use as cold rubber catalysts; hydroperoxides have already served the synthetic rubber industry well in that capacity. Cumene hydroperoxide was the old standby for cold rubber, now is rapidly giving way to diisopropyl benzene hydroperoxide.

As a matter of fact, menthane hydroperoxide already has a record of cold rubber catalysis. Synthetic Rubber Branch*, which establishes manufacturing specifications for all GR-S rubbers, has tried it in several runs, tells CW it's faster than the diisopropyl benzene. Incidentally, Hercules Powder Co. has been selling menthane hydroperoxide for some time, has even published literature on its application for cold synthetic rubbers.

Hercules' product, a liquid mixture of menthane hydroperoxide isomers, has been evaluated as a catalyst, found to be particularly useful in the preparation of cold synthetic rubbers like GR-S-100.

The activity of menthane hydroperoxide as a redux emulsion polymerization catalyst is high—higher than either cumene or diisopropyl benzene hydroperoxide. Aside from its use in synthetic rubber production, menthane hydroperoxide could catch on as a catalyst for the emulsion polymerization of other monomers (e.g. acrylonitrile, methyl methacrylate, vinyl acetate, vinyl chloride and isoprene).

Both menthane and pinane hydroperoxide look interesting as cold rubber catalysts, but so do many other new candidates for the job. Right now the latter is purely a research item. And it will be just that until it gives consistent and reproducible results, acceptable under synthetic rubber standards. Dependability of supply is another important criterion for its future commercial success, but one that should not be hard to meet.

And if pinane hydroperoxide can catalyze the polymerization of as many monomers as its menthane relative, its path should be that much smoother.

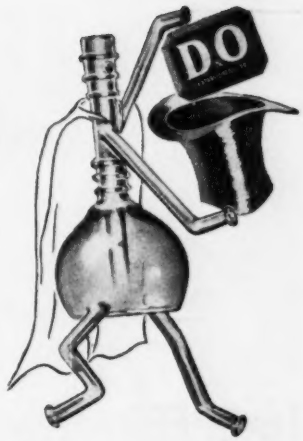
**No Puzzler:** Pinane hydroperoxide manufacture isn't calculated to tax the ingenuity of potential producers; by the U.S.D.A. method, only two steps are needed to make the substance from gum turpentine in 50% concentration.

Briefly here's how the process works: Naturally-occurring pinenes in gum turpentine are converted to pinane by catalytic hydrogenation with the same catalyst and equipment normally used to hydrogenate cottonseed oils. The pinane is then oxidized with oxygen (or air) to give the hydroperoxide.

Terpene hydroperoxide manufacture, in general, is far from virgin territory. Aside from menthane hydroperoxide, Hercules will make substantial quantities of cymene hydroperoxide as an intermediate in its new cresol production.

The U.S.D.A. research probably won't raise many eyebrows among synthetic rubber people. But don't minimize its importance. It's significant as another effort in a long-standing program designed to work up new markets for a gum naval stores industry in need of expanded outlets.

* Of the Reconstruction Finance Corp.'s Office of Rubber Reserve.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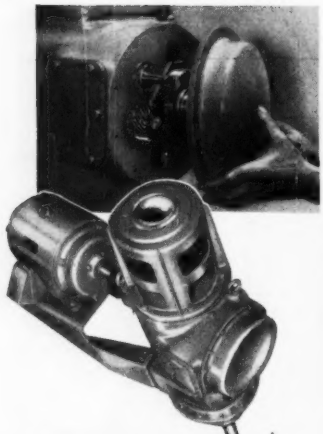

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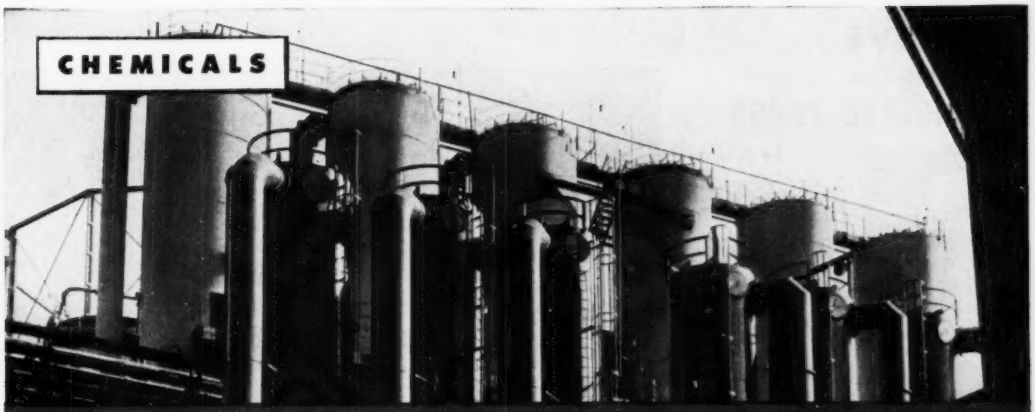
What is hardly realized, is that "wonder drugs" are the exception rather than the rule. For every medically-accepted antibotic there are hundreds that never panned out in research.

Another exception, this week, took its place among the favored few. It's neomycin, in commercial production for the first time at Heyden Chemical Corp.'s antibiotics division, Princeton, N.J.

Neomycin was discovered in 1949 by Selman Waksman and Hubert A. Lachevalier of Rutgers University. Streptomycin had been isolated five years before and its activity, especially against tuberculosis bacteria, was well-defined in 1949. But the resistance to the antibiotic that susceptible organ-

**NEOMYCIN BROTH assays are done with cup plates at Heyden's antibiotic laboratories. Unknowns are compared to standard solutions to determine potency.**

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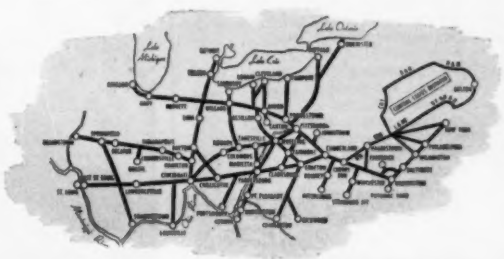

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Heyden pioneered commercial development of neomycin, says research has proved the drug "effective in treating infections of the skin, eyes, ears, nose and gastro-intestinal tract." The company will offer the antibiotic in bulk to ethical pharmaceutical manufacturers in this country, will market neomycin for export as well.

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1. Murdock, Harold R., Ind. and Eng. Chem., Vol. 43, November, 1951.

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**New Role:** Pentaerythritol tetranitrate, familiar as an explosive, is now doing duty as a drug. It's the active ingredient in Peritrate, a new preventive for angina pectoris developed by Chilcott Laboratories, Morris Plains, N.J. Clinical trials showed a beneficial response in a majority of cases with a relative lack of toxicity in two to three times the maximal therapeutic dose. Peritrate will in no way replace nitroglycerin for the treatment of angina attacks; its value is solely as a preventive.

•

**Resin Stabilizer:** Witco Chemical Co. (New York, N.Y.) is out with a new polyvinyl chloride resin stabilier which is calls Witco Stabilizer No. 80. A combination of barium and cadmium soaps with a synergistic stabilizer, the new product is effective against both heat and light degradation. And the combination of the three stabilizers in one fluid composition should simplify polyvinyl chloride formulations. Witco says No. 80 is well-suited for plastisols and organosols since no pregrinding is necessary for complete dispersion.

•

**Radioactive Cortisone:** Sloan-Kettering Institute (New York, N.Y.) researchers Fukushima, Kritchewsky and Eidinoff have synthesized radioactive cortisone as part of a study of the hormone's physiological fate. Water, enriched with tritium (hydrogen-3), was used to introduce the tracer element by means of a platinum-catalyzed exchange reaction in acetic acid. In the final radioactive product, the majority of the isotope was localized at the number 16 carbon atom.

•

**Antibiotic Recovery:** Three new patents (U.S. 2,560,889, - 890, - 891) awarded to researchers of Chas Pfizer & Co. highlight advances in the recovery of antibiotics from fermentation broths.

The Pfizer workers have precipitated streptomycin quantitatively with the dye salt, sodium p-(2-hydroxy-1-naphthylazo) benzenesulfonate. Further along, a streptomycin salt of high activity is obtained from salts of beta-p-(2-hydroxy-1-naphthylazo) benzenesulfonic acid by reaction with an amine salt. Methanol-soluble triethylamine salts may be used to recover the streptomycin; streptothricine, polymixin and bacitracin also are amenable to this procedure.

Antibiotics may also be quantitatively precipitated from fermentation broths with the disodium salt of 8-amino-7 - p-nitrophenylazo - 2-phenylazo-1-naphthol-3,6-disulfonic acid.


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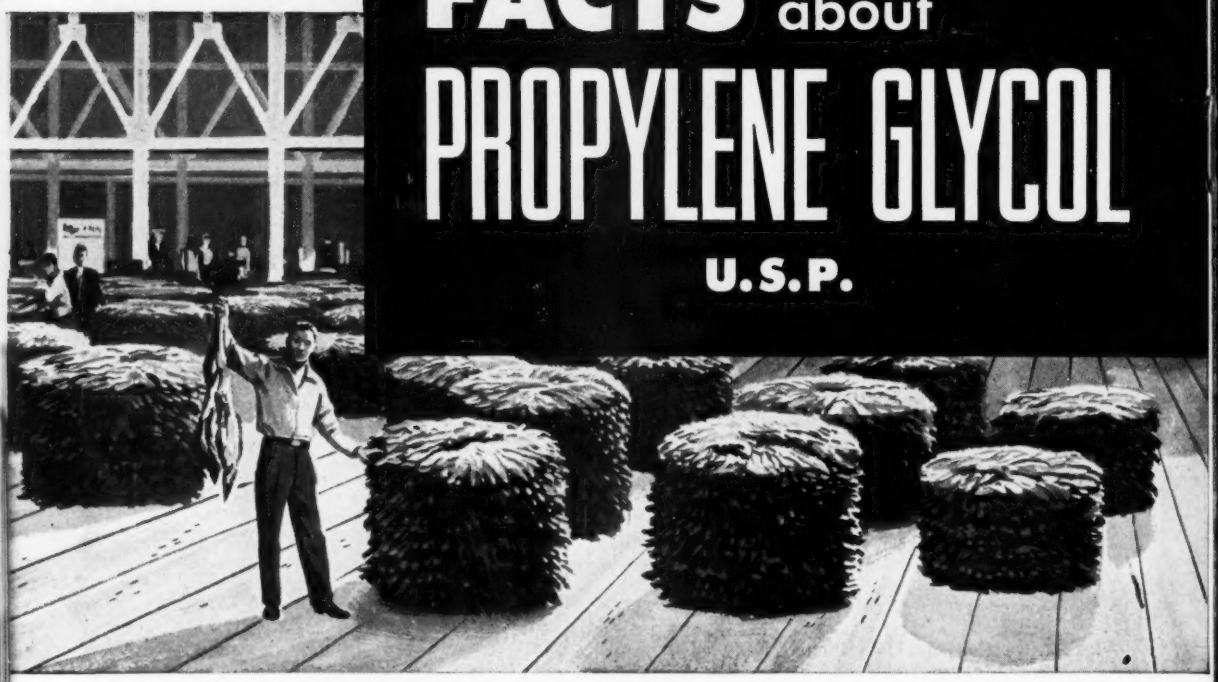
# FACTS about PROPYLENE GLYCOL U.S.P.



PROPYLENE GLYCOL, U.S.P., made by The Dow Chemical Company, is a product of consistent, high purity prepared specifically for tobacco, food, drug and cosmetic use. The fact that it meets the high standards required for inclusion in the United States Pharmacopoeia indicates its applicability to pharmaceutical preparations, as well as to foods and cosmetics.

To assist you in evaluating the functions of propylene glycol, U.S.P. in your product, Dow presents the following information on a number of practical uses for this highly efficient chemical. Despite current shortages, Dow continues to be interested in helping you solve your production and experimental problems.

**THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN**

## *PROPERTIES and General Uses*

An outstanding characteristic of propylene glycol, U.S.P. is its solubility in all proportions in water. Moreover, it will dissolve and put into water solution many organic chemicals. Thus, it is widely used in the preparation of foods, flavors, cosmetics and pharmaceuticals.

Propylene glycol is also an extremely effective softening and moistening agent, as indicated by the hygroscopic quality of water solutions containing large amounts of the chemical, plus its characteristic plasticizing action. As a moisture control agent, it is used in tobacco for cigarettes. Propylene glycol also inhibits mold growth. It is used to extend the shelf life of certain foods, as well as to prevent mold contamination of idle food machinery.

### *ADVANTAGES OF PROPYLENE GLYCOL, U.S.P.*

1. Odorless
2. Relatively tasteless
3. Low volatility
4. Acceptable in foods
5. Emulsifying aid
6. Wetting agent
7. Humectant
8. Preservative
9. Plasticizer
10. Excellent solvent

### DOW PROPYLENE GLYCOL, U.S.P.

**Conforms to or exceeds the specifications established by the U.S. Pharmacopoeia XIV (1950)**

**INTERPRETATION OF U.S. PHARMACOPOEIA SPECIFICATION**

| | |
|---|---|
| Specific Gravity @ 25 /25°C. | 1.035-1.037 |
| Distillation Range (Method 2 U.S.P. XIV) I.B.P.-D.P. | 185-195°C. |
| Identification | Passes Tests |
| Ash | Not more than 0.007% |
| Acidity (As Acetic Acid) | Not more than 0.0115% |
| Chloride | Not more than 0.07% |
| Sulfate | No Turbidity* |
| Heavy Metals | Not more than 5 p.p.m. |
| Arsenic (as $As_2O_3$) | Not more than 2 p.p.m. |

*Method: Dilute 5 cc. of propylene glycol with 15 cc. of distilled water and add 5 drops of Hydrochloric Acid and 5 drops of Barium Chloride T.S.

*This is one of a series of Dow advertisements you may wish to keep on file for reference and information. Write Dow for reprints.*

## Propylene Glycol in FOODS

Because of its solvent, preservative, hygroscopic and wetting properties, and especially because of its economy in use, propylene glycol has found wide acceptance in the food field. Apparently, the only class of flavoring raw materials not sufficiently soluble in propylene glycol for the practical preparation of flavor solutions is the citrus oils. However, by using edible wetting agents, it is possible to prepare a 5% orange oil colloidal dispersion in propylene glycol which, to all appearances, will be a solution.

In addition to the preparation of flavor solutions, propylene glycol, U.S.P. is being used as a solvent for the extraction of vanilla flavor from vanilla beans and also in the preparation of a coffee flavor from ground roasted coffee. As a corollary to the flavor use of propylene glycol, many manufacturers have found that it makes an excellent food color solvent and that its use necessitates only very slight alterations in basic food color formulas.

Another interesting and relatively undeveloped use of propylene glycol is in increasing the effectiveness of shortening in the production of baked goods. Apparently the emulsifying or wetting action of the chemical aids in the dispersion of the shortening throughout the batch. Much investigation remains to be done on this phase of propylene glycol use, but it is apparent that a definite benefit can be obtained.

Being a hygroscopic material, propylene glycol in sufficient concentrations tends to attract moisture from the air and, as a result, baked goods, to which a very small proportion of propylene glycol has been added, have a considerably enhanced shelf life.

This preservative action, so apparent in the use of propylene glycol in baked goods, points logically to its use in other food products which require a preservative. Actual laboratory tests have shown that a 15% concentration of propylene glycol will inhibit the growth of mold on nutrient media, and it is quite possible that a smaller concentration would retard the growth of spoilage organisms under less ideal growing conditions. Although the subject has not been fully explored, there is reason to believe that many solid foods can be placed on the market in better condition through the use of small quantities of propylene glycol.

## PHARMACEUTICALS

The same qualities which make Dow propylene glycol, U.S.P. useful in food and flavoring preparations can be of great assistance in preparing pharmaceutical formulas. Here it acts as a carrier, solvent, emollient, humectant, lubricant and preservative.

The manufacturer of pharmaceutical preparations, whether for internal consumption, topical application or injection, must first solve the problem of finding a solvent which, in addition to being a good carrier, forms an acceptable medicinal. Propylene glycol, U.S.P. has been used in many approved pharmaceutical preparations and, in many cases, its preservative action is of considerable importance.

The versatility of the solvent properties of propylene glycol, U.S.P. applies to many organic chemicals used in the field of chemotherapy. Its use therefore should be considered in many estrogens, antiseptics, salves, elixirs, ointments and other types of pharmaceutical preparations.

## COSMETICS

Dow propylene glycol, U.S.P. is used as a carrier, emollient, humectant, and preservative in many types of cosmetics. A great number of manufacturers of creams, lotions and similar products have discovered the advantages of propylene glycol's soothing and softening effect without residual stickiness. Propylene glycol can often be used in place of a more expensive ingredient and often will yield a superior product. In many cases, the addition of propylene glycol requires only a very slight change in the old formula to provide a high quality cosmetic.

Propylene glycol has been found effective in the preparation of lotions (whether non-alcoholic, mildly alcoholic or strongly alcoholic), cold creams and "all purpose" creams, hormone creams, vanishing creams, practically every type of facial make-up, permanent waving solutions and wave set solutions, shaving creams, soaps, shampoos and sun tan preparations.

*This material is presented for what assistance it may give and is merely to be taken as indicative of the characteristics of DOW propylene glycol, U.S.P. and is not to be construed as specific recommendations.*

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**Midland, Michigan**

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☐ **Please send me additional literature about propylene glycol, U.S.P.**

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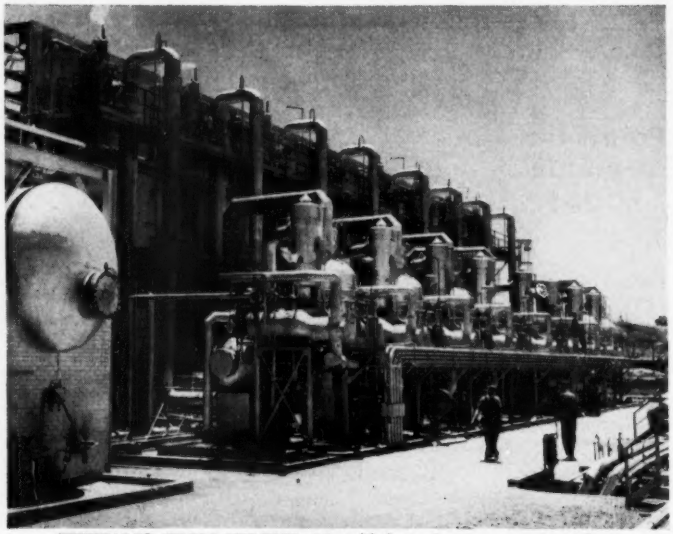

PHTHALIC FROM XYLENE: Most likely to become more popular.

# Three Ways to Phthalic

Both I.C.I. and Sherwin-Williams are putting their faith in fluid bed phthalic plants.

Main points of difference in commercial processes lie between the two starting with naphthalene.

Now several companies are looking at ortho xylene as a raw material for a fluid bed phthalic plant.

**Although phthalic anhydride** may be the darling of the resin trade, it will never take any honors in a popularity contest among the men who are actually responsible for producing it. As one harried production executive once put it: "They ought to give medals for making phthalic."

So among men who know phthalic best, there has been a constant search for cleaner, smoother processing techniques. A lot of progress has already been made along those lines in the conventional process which is essentially a fixed bed, vapor phase oxidation of naphthalene.

But when Sherwin-Williams made its commercial debut as a phthalic producer in 1944, it borrowed a page from the petroleum book on catalytic cracking, modified the original process by using a fluid bed. Sherwin-Williams, however, with an estimated annual capacity of 2½-3 million lbs., has been a relatively minor factor as a phthalic manufacturer and, among experts, there was wide-spread skepticism on the merits of the process.

Now, recent moves may help to dispel some of the skepticism, for Sherwin-Williams is going to spend $1 million to increase capacity of its Chicago fluid bed plant for making phthalic. Further evidence that the process is here to stay: M. W. Kellogg, which designed and built the S-W plant, will build a similar plant for I. C. I. to turn out 35 million lbs. a year.

**The Yield's the Thing:** One of the most attractive features of the fluid bed process is the possibility of getting higher yields. The Germans, who originated the idea, glibly reported 100-105 lbs. of phthalic per 100 lbs. of naphthalene.

Theoretically, the yield from 100 lbs. of naphthalene is 116 lbs. In this country, the most widely quoted figure is 80, although even that may be somewhat high. Certainly there are commercial units getting 80 but some experts think many are getting 75 or lower.

Initial small-scale tests in this country seemed to substantiate the German

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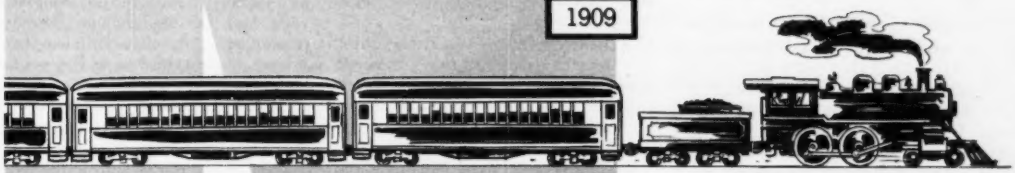
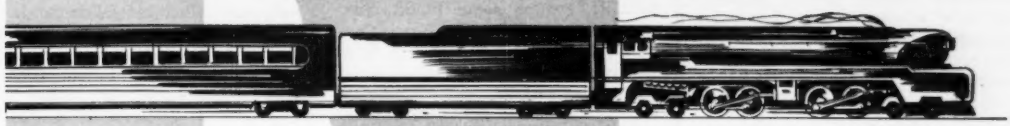


*over 40 years of progress in chemicals*



1952

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NP117

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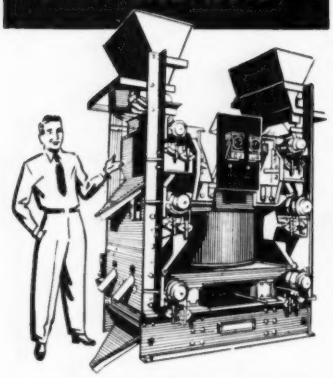

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figures for the fluid bed process, but later ones could not reproduce them. One trade belief: The Germans were charging refined naphthalene—a procedure economically unsound in the U. S. Also, it is almost certain that yield varies with the sulfur content of the naphthalene charging stock.

In its first commercial runs, Sherwin-Williams was able to get yields of roughly 100 lbs. of crude phthalic. At first, it was thought that no additional processing would be required but presumably the crude phthalic did not pass muster for Serwin-Williams has been sending its product out for further refining. A good guess at this point is that a well-designed fluid bed unit, using the right catalyst will turn out phthalic anhydride that will need further refining but that it will be able to turn out about 95 lbs. of refined phthalic per 100 lbs. of naphthalene.

**Two Alike:** Presently, there are three commercial processes for making phthalic anhydride: from naphthalene by fixed bed and by fluid bed processes and from ortho xylene by a fixed bed process. In general, the two fixed bed processes are quite similar; American Cyanamid, in fact, reports that it is set up to operate on either naphthalene or ortho xylene.

Main points of difference are between the two naphthalene processes. They are:

- Reactors: In the fixed bed process, reactors consist of many catalytic tubes—one now on the drawing boards calls for 4,000 tubes. In the fluid bed process, the reactor is a large, single vessel.
- Catalysts: In fixed bed units the catalyst is vanadium pentoxide on an inert support. Fluid bed units employ vanadium pentoxide, poisoned with potassium sulfate, on an activating support. Particle size for the fluid bed is much smaller and on the introduction of air, particles become fluidized, actually assume some liquid characteristics.
- Introduction of charge: In fixed bed processes, the naphthalene is vaporized before being sent to the catalytic tubes. In the fluid bed process, naphthalene is added to the reactor in liquid form, is vaporized on contact with the catalyst particles.
- Quantity of air: Theoretically, only 5 lbs. of air are required to oxidize 1 lb. of naphthalene to phthalic anhydride. In most fluid bed units, 25-30 lbs. of air are used to avoid operating within the explosive range. In fluid bed units, the temperature of reaction is lower due to a longer contact time and no large excess is required. There are exceptions to this difference, however; for some fixed bed units are operating safely within the explosive range.
- Temperature control: The reaction is exothermic. (Over 8,000 Btus. are released per lb. of naphthalene charged and temperature control is critical.) In fixed bed units, heat is removed by mercury or by a fused salt bath. In the fluid bed process, temperature is controlled by circulating some of the catalyst from the reactor through cooling water.
- Product recovery: Gas from the reactor is sent through a vapor cooler and brought to a temperature just above the dew point of phthalic. In older, fixed bed units, the gas is sent to "hay barns" which are simply large box-like air condensers. Phthalic hay crystallizes on the walls and is periodically "raked" out. Newer fixed bed units, like fluid bed ones, employ two tubular condensers. Phthalic crystallizes on the surface until condenser efficiency falls to a certain point; the gases are then sent to the second condenser while a heating medium melts the phthalic on the first.

**Fertile Field:** A fluid bed process using ortho xylene as a raw material is a distinct possibility. Reportedly, several firms are currently taking a hard look at the method.

In any event, xylene as a phthalic raw material seems destined for wider use, especially for firms not integrated with coal tar naphthalene. Oronite, present producer of naphthalene from xylene, has established a big market for para xylene in Du Pont's Dacron synthetic fiber. More petroleum from benzene is bringing huge quantities of xylenes and with separation of the isomers economically attractive, supplies of ortho xylene are due to increase.

On the other hand, there is not enough naphthalene to keep everyone happy. If phthalic producers with captive naphthalene increase their phthalic output, they will start competing with their customers for raw materials. In such a case, the customer is bound to lose. That's one probable reason why Cyanamid, for one, is prepared to use either naphthalene or ortho xylene.

## Poser Progress

**Experts have thought that converting carbon to electrical energy with an overall thermal efficiency of 80% is impossible. But it's not, according to one of two recent patents issued to Everett Gorin, assigned to Pittsburgh Consolidation Coal Co.**

Gorin was the cause of quite a stir last year (*CW, Dec. 1, '51*) when he was granted a patent (U.S.P. 2,570,-

543) on a means of converting carbon to electrical energy with an efficiency* of 75%. Then, as now, his company was unwilling to discuss the potential impact of Gorin's work.

But chemical engineers, famous for a conservative, even skeptical, outlook, on such inventions were comparing Gorin's work to the development of the steam engine. If it proved commercially sound, they said, it would lift the face of whole segments of industry.

**Carbon Energy:** Gorin's work is based on a fuel cell consisting of an anode and a cathode separated by a solid electrolyte. In a gasification chamber, steam and a carbonaceous material are reacted to form water gas (carbon monoxide and hydrogen). An oxidizing gas (preferably air) is directed past the anode and, through the medium of the electrolyte, oxidizes the water gas which is directed past the cathode. Part of the resulting heat of combustion is thus converted into electrical energy.

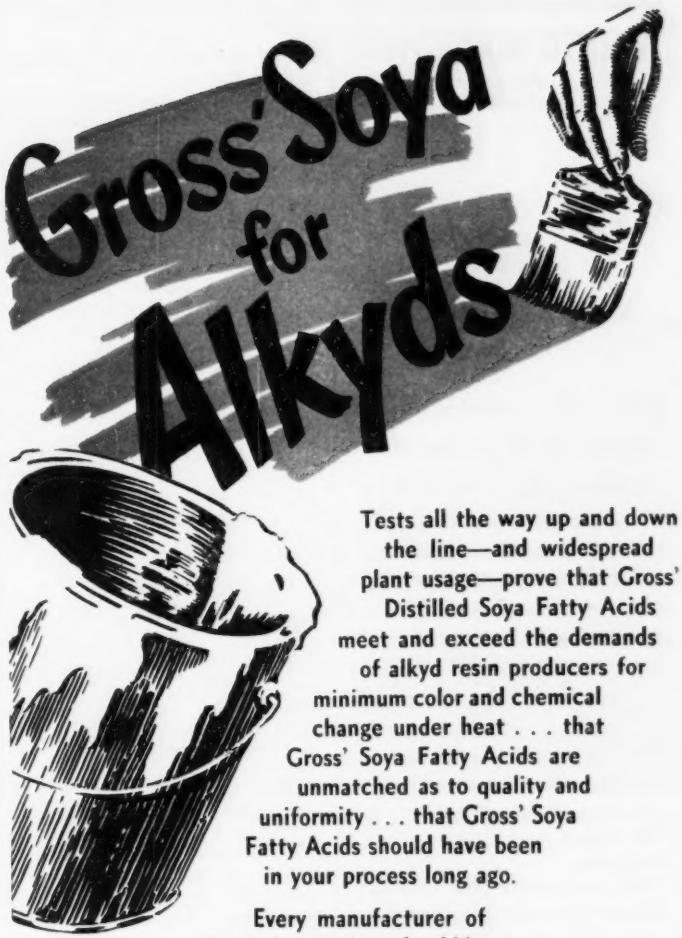
Gorin, however, is quick to point out that the fuel cell, in itself, is not new. Others have built them, have been able to get overall thermal efficiencies of 40%. His innovation is an arrangement of the apparatus so that he is able to get unheard-of efficiencies.

In the first patent, Gorin described a method in which the fuel cell is immersed directly in the fluid bed of the gasification chamber. Energy not used for generating electricity was released in the form of heat and transferred quickly and uniformly to the fluid bed.

The only trouble with that, says Gorin, is that thermal efficiency is directly proportional to the conversion of steam to water gas. In order to attain peak efficiency—75%—it is necessary to convert 90% of the steam. And since it is necessary to operate the gasification chamber at a temperature considerably lower than that of the fuel cell, he had to use highly reactive chars or a gasification catalyst.

So, in one of his recent patents (U.S.P. 2,581,650), Gorin explains a method whereby the gasification chamber can be operated at substantially higher temperatures. To do this, Gorin separates the gasification chamber and the fuel cells. Energy not used for generating electricity is again released as heat, but instead of a direct transfer to the flud bed, it is used to raise the temperature of steam that is circulated in direct heat exchange relationship with the hot zone surrounding the fuel cells. The re-

* Electrical energy produced divided by the heat of combustion of the carbon.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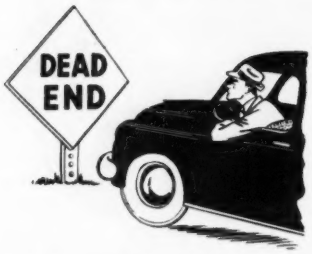


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sultant steam is recycled to the gasification chamber.

This modification permits operation of the gasification chamber at considerably higher temperatures and therefore facilitates the conversion of steam to water gas. And although there is some sacrifice in efficiency, Gorin reports he was able to approach efficiencies of 60%—a 50% increase over attempts by earlier workers.

**Without Catalysis:** In his second modification (U.S.P. 2,581,651), Gorin is able to get 80% efficiency without the use of reactive chars or catalysts. Moreover, he says that efficiency is not related to the conversion of steam which can be as low as 5% —10%.

For the high efficiencies, Gorin immerses the fuel cells in the fluid bed as in the original method. Water gas from the gasification chamber is cooled so it can be pumped, then reheated before being sent to the fuel cells. Exit gases from the cells consist of carbon dioxide, steam, water gas and spent air. Some of the carbon dioxide and steam is recycled through the gasification chamber; the rest of the exit gases is passed through heat exchangers and the spent air discharged. Next carbon dioxide is stripped and discharged and the remaining water gas is fed directly to the fuel cells.

**Only One Phase:** Unquestionably, Gorin's work opens up attractive possibilities but it will be some time before its economic significance can be measured. At present, Pittsburgh Consolidation Coal says merely that it is exploring many paths toward the goal of a more efficient use of the energy in coal and that Gorin's work is only one phase. But it's a phase that is making industry rife with speculation.

## EQUIPMENT. . . .

**Chemical Standards:** A subcommittee of the Chemical Industry Correlating Committee (American Standards Association) is now working on valve standards for handling certain chemicals, including sulfur dioxide, hydrogen sulfide and anhydrous ammonia. Currently, tentative standards are being drafted.

•

**Safer Motor:** To meet increased demands, says U. S. Electrical Motors (Los Angeles), it has designed an explosion-proof variable speed motor. Instead of the conventional method of connecting an explosion-proof motor with a separate speed changer, the motor is a self-contained unit. Thus, says the company, it results in a savings on space and eliminates the danger of intermediate connections. The motor is available in output speeds ranging from 2,000 to 10,000 rpm., ratings from 1 to 20 hp.

•

**Ammonia Transfer:** Worthington Pump and Machinery Corp. has brought out a new LPG-A Transfer Unit for moving ammonia from the tank car to storage tank. Worthington reports that the unit will transfer not only the ammonia but the residual vapors in the car. It adds that the residual vapors, often left in the car, are equivalent to 800-1,200 gal. of ammonia per car.

•

**Drum Servicing:** Newark Steel Drum Co. (Linden, N.J.) is currently expanding its drum reconditioning facilities as well as its drum servicing plan. Besides reconditioning, the service includes: labels for drums, free storage and insurance, free pick-up for truckload lots within 25 mi. of the plant, and a saving (over lcl. rates) for pick-up within 150 mi. of the plant.

•

**Filling Scale:** Thayer Scale and Engineering Corp. is now selling a filling scale that automatically bags the product and gives the net weight. Accuracy is guaranteed to 0.1 lb. for any weight between 25 and 200 lb. Thayer figures the machine will permit substantial savings in time and material—without the risk of underweighing. It adds that the range and accuracy should make it useful for automatic batch-weighing.

•

**Paper Thermometers:** Developed by the Army Quartermaster Corps., thermal indicators made of paper could conceivably be valuable in the process industries. They can determine temperatures in the range of 115 F. to 500 F., are readily disposable and when made commercially available should not cost more than a few cents each, according to the QM.

The indicators consist of white pigment coatings on black paper, each coat designed to melt at a different temperature. When the temperature is reached, the white coating melts and disappears into the black porous paper. Since the change is irreversible, the indicators give a permanent record of the temperature attained.

•

**Plastic Joint:** Robinson Clay Products Co. is now producing clay pipe lengths with a male-threaded polyvinyl casting at each end. The collar is also made of PVC. Advantages claimed: pipe lengths that are easily joined and a joint that is leak-proof, resistant to most chemicals.

# QUALITY *is important*

## ... NOW MORE THAN EVER

*Partial view of plant at Neville Island, on the Ohio River, 8 miles west of Pittsburgh, Pa., showing main resin manufacturing and solvent refining units.*

Neville service to industry is characterized by a traditional policy of continuous development and expansion, and co-operative technical assistance that means much to the buyer of chemicals.

You can be sure of quality on any Neville product you use—whether a resin, oil, solvent or specialty!

THE NEVILLE COMPANY **NEVILLE** PITTSBURGH 25, PA.

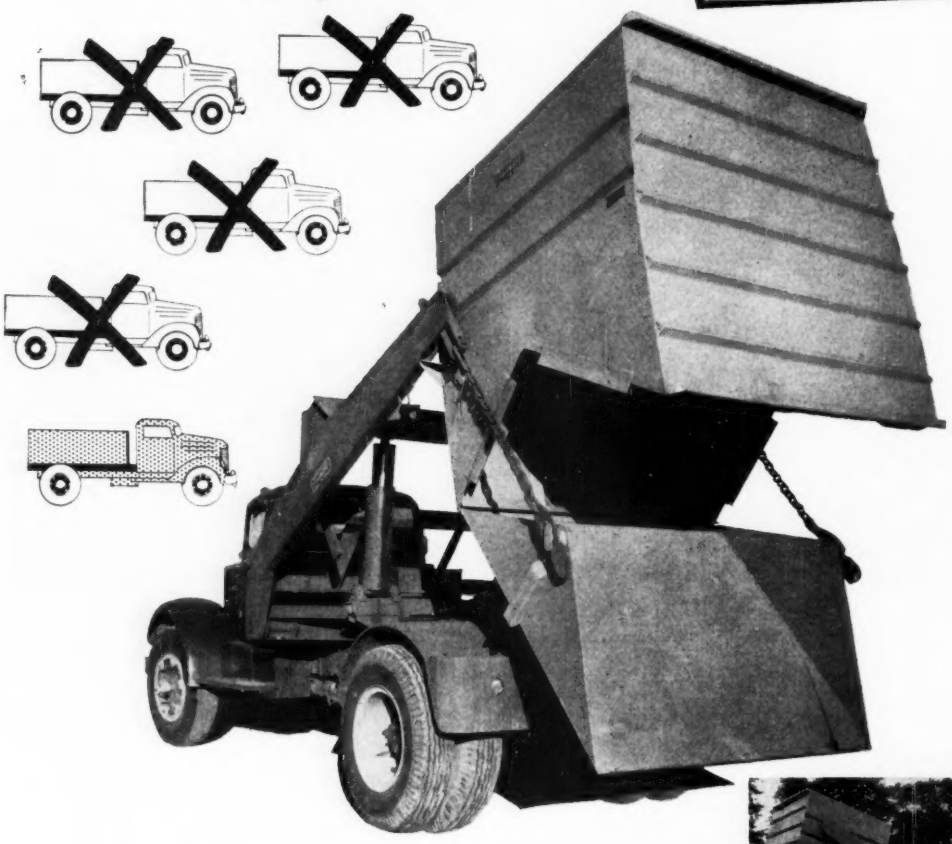
*Plants at Neville Island, Pa., and Anaheim, Cal.*

A-40

# You Can Do The Work of 3 to 5 Conventional Trucks With Only One

DEMPSTER DUMPSTER

TRADE MARK REG.



In many plants handling materials by the Dempster-Dumpster System, one truck-mounted Dempster-Dumpster, operated by only one man, the driver, has replaced 3 to 5 conventional trucks and crews. One Dempster-Dumpster services a multiple number of detachable containers in a wide variety of designs best suited to the type of materials handled—be they bulky, light or heavy . . . solids or liquids . . . trash or rubbish. Containers are conveniently located at accumulation points inside and outside buildings. The Type LFW Dempster-Dumpster shown above handles containers up to 12 cu. yds. Containers up to 21 cu. yds. are available with our Type ARLF and DTLF Dempster-Dumpsters. Without question, the Dempster-Dumpster System is the most economical and most efficient method of plant materials handling by truck yet devised! Write today for complete information. Manufactured exclusively by Dempster Brothers, Inc.

DEMPSTER-DUMPSTER, operated by means of hydraulic controls in cab, picks up each container, hauls and empties it or sets load down intact.

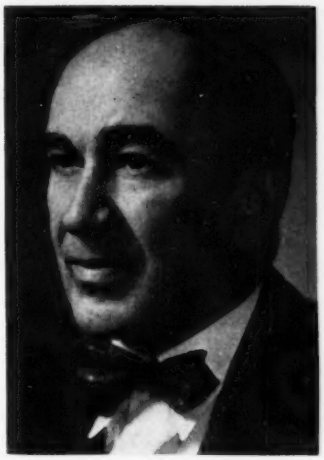
**DEMPSTER BROTHERS, 222 Dempster Bldg., Knoxville 17, Tenn.**

# Export Push Revamps Sales Set-Up

Dow Chemical Co. sets up two new export companies to handle its first large-scale entry into the export market.

Doubled export sales volume necessitates sales offices in South America, Europe and Asia.

Easing of domestic shortages spurs Dow to join other American companies in finding new markets overseas.



**SHOEMAKER: For expanded exports, centralized sales.**

**The formation last week** of two new export companies, Dow Chemical Inter-American, Ltd. and Dow Chemical International, Ltd., served notice on the industry that Dow is embarking on its first large-scale export sales program.

Up to now Dow's export business has never been more than 4-5% of its total sales. This volume was easily handled by the company's regular sales set-up, following the normal channels for domestic orders. Now the company's new plans call for doubling this volume, boosting exports to around 10% of total sales. With as large a volume as this, it became obvious that some system would have to be set up specially for export business.

**Planning Stage:** Clayton S. Shoemaker, president of the two new export companies, emphasizes that the actual machinery of the new companies is still in the planning stage, but the general outlines are set.

Dow Chemical Inter-American, Ltd. will handle Latin-American business from a headquarters to be established in South America. Dow Chemical International, Ltd. will serve the rest of Dow's proposed market areas with two headquarters, one in northern Europe, and the other probably in Hong Kong. Details of location, or countries or products to be given primary emphasis, are still top secret at Dow.

As a basic policy all foreign sales offices will be staffed with Dow-trained local personnel under the supervision of a manager and an assistant manager from Dow in this country. The local people who become Dow employees will enjoy the same advantages that Dow's American employees do. Obviously any other treatment would make it more difficult to secure the best people, and Dow wants to obtain the very best in foreign sales personnel.

If it is found necessary to have technical people on the sales office staffs in the various countries, Dow will add them, drawing competent men from both the United States and the local area. Since many of Dow's products may prove unfamiliar to foreign consumers, it is more than likely some technical staff will be necessary.

**Favorable Areas:** While it is still too early to say just where the initial push will be launched, it is plain that the immediate targets will be areas free of severe currency exchange and tax barriers.

Once the machinery is established, foreign customers will be given equal treatment with domestic customers unless there are interfering government restrictions.

The companies plan the erection of some plants abroad, but just how many and where is still highly problematical. At the moment a study, which will last two years or more, is being made to determine whether plants will be built and where. Two things are certain: Any plants established will be operated on a 50-50 basis with local business men, and favorable tax conditions will be a decisive factor.

**Pinch Easing:** Dow's entry into the export market on a large scale at this time is apparently based on the easing of shortages of many of its products, and the impending easing of others. At present the company is increasing its exports of caustic soda, polystyrene plastics, and styrene monomer, all materials that have recently come out from under the pinch, and phenol, which is apparently slated for improvement very soon.

With production continually expanding, and domestic markets more or less satisfied, the company, like so many others, is turning to foreign markets to take up the excess.

# Transport Regulations Report

**Fair user charges on inland waterway carriers and taxes on standard axle-load limits, are only two of the recommendations made recently by Senator Bricker (R-Ohio) in a report made as a member of the Senate Committee on Interstate and Foreign Commerce.** Although it is unlikely that the report will cause any immediate changes in Federal regulations involving transport, it could have serious future consequences on an industry with such heavy and diversified use of transportation as the chemical industry.

Essentially the "Bricker Report" says that Government regulations favor other means of transportation at the expense of the railroads. In fact, the report apparently suggests, the present climate of transport regulations tends to be one of protecting the other types of carriers from railroad competition. Federal aid in improving harbors, waterways, and highways, is cited as an example of this atmoshpere unfair to railroads.

**Railroad Dilemma:** In discussing the particular problems of the railroads, the report reaches a number of conclusions and recommendations. Among these is the finding that freight charges constitute a relatively small and decreasing portion of national income, reflecting the lowered prosperity of railroads. As a partial explanation of this the report cites "the atrophy of managerial incentives caused by the tendency of the Interstate Commerce

# FATTY ALCOHOLS

now available in large quantities

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**STEARYL ALCOHOLS**

Technical Grade . . . . (Sap. value 2 max)
Commercial Grade . . . (Sap. value 2 max)

**CETYL ALCOHOLS**

Cosmetic Grade . . . . . (Sap. value 2 max)
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*Shipped in:* 50 lb. bags
200 lb. fiber drums
steam-coiled tank cars

**unsaturated**

Liquid Alcohols, High Cloud (Sap. value 3 max)
Liquid Alcohols, Low Cloud (Sap. value 3 max)

*Shipped in:* 400 lb. steel drums
tank cars

*Sample packaged in convenient glass jars:*
*1/2 lb., 1 lb., 4 lb. sizes*

Write for specifications, information and samples

Hydrofol PRODUCTS

ARCHER • DANIELS • MIDLAND COMPANY

Chemical Products Division
2191 West 110th Street • Cleveland 2, Ohio


## DISTRIBUTION . . .

Commission to substitute its own judgment for that of management."

Bricker goes on to blast present regulations in general with such charges as:

- Railway Express losses are primarily due to subsidized parcel post services for which there is no justification.
- Many railroads lose money because they cannot abandon unprofitable commuter services because state governments oppose the move.
- Government aid is the greatest unbalancing element in the transportation industry.

**Freight Rates:** In the controversial matter of freight rates, vital to many companies in the chemical industry whose plants are far from their market areas, the report has this to say: "The factors to be considered by the ICC in establishing rates need limitation; second, the rule of rate making needs revision . . . it is suggested that consideration be given to a modification of existing legislation to permit the railroad management to increase rates and charges without Commission interference . . ."

•

**Plastic Latices:** Naugatuck Chemical Division, United States Rubber Co., has opened a new branch sales office for rubber and plastic latices. Located in Memphis, Tenn., the new office will sell to the manufacturers of paints, adhesives, balloons, carpets, and paper and textiles in eleven Southern and Southwestern states.

•

**Domestic Divisions:** Three new domestic sales divisions have been formed by Ferro Corp., Cleveland, bringing the total to sixteen. The new divisions were planned to aid the 1952 sales goal of $40 million—up 10% over 1951.

•

**Exclusive Representative:** Vancouver Engineering Works, Ltd. has been appointed exclusive representative in British Columbia for the De Laval Steam Turbine Co., Trenton, N.J. The Canadian company will carry all the De Laval Co.'s standard products, but special jobs will be handled from Trenton.

•

**Better Service:** Continuing the expansion of its sales and warehousing facilities to give better service, Minnesota Mining & Manufacturing Co. has opened a new regional sales office and warehouse building in Atlanta, Ga. This is the fourth such expansion in the past year.

# Jefferson Ethylene Glycol

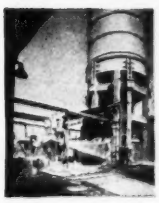
## *A versatile industrial chemical*

**For use in the production of . . .**

| | |
|---|---|
| Antifreeze | Industrial Explosives |
| Cellophane | Synthetic Fibers |
| Alkyd Resins | Hydraulic Fluids |

For these and many other uses the high purity and uniformity of Jefferson ethylene glycol meet the most exacting demands of experienced chemical manufacturers.

For information on price and availability write today to our Sales Division, Department B.



*Quicklime silo and lime slakers in ethylene oxide and glycol unit at Jefferson's Neches plant.*

**Jefferson Chemical Company, Inc.**

711 FIFTH AVENUE, NEW YORK 22, N. Y.

**ESSENTIAL CHEMICALS FROM HYDROCARBON SOURCES**

ETHYLENE OXIDE
ETHYLENE GLYCOL
ETHYLENE DICHLORIDE
DIETHYLENE GLYCOL


# *Briefs*

## *From recent literature*

*No. 3 in a Series*

**Improved dyed nylon** fibers are obtained by following a conventional dying and fixing procedure with passage of the dyed fiber into 75% aqueous ethylene glycol maintained at its boiling point. The fastness of the dye to light, washing and rubbing is thus substantially increased.

**Polymers** varying from viscous oils to hard resins result when ethylene glycol or diethylene glycol are reacted with divinylsulfone in the presence of a basic catalyst. Ethylene dichloride may be used as a solvent. Certain of these polymers have proven useful as thermoplastic molding compositions and in the production of fibers.

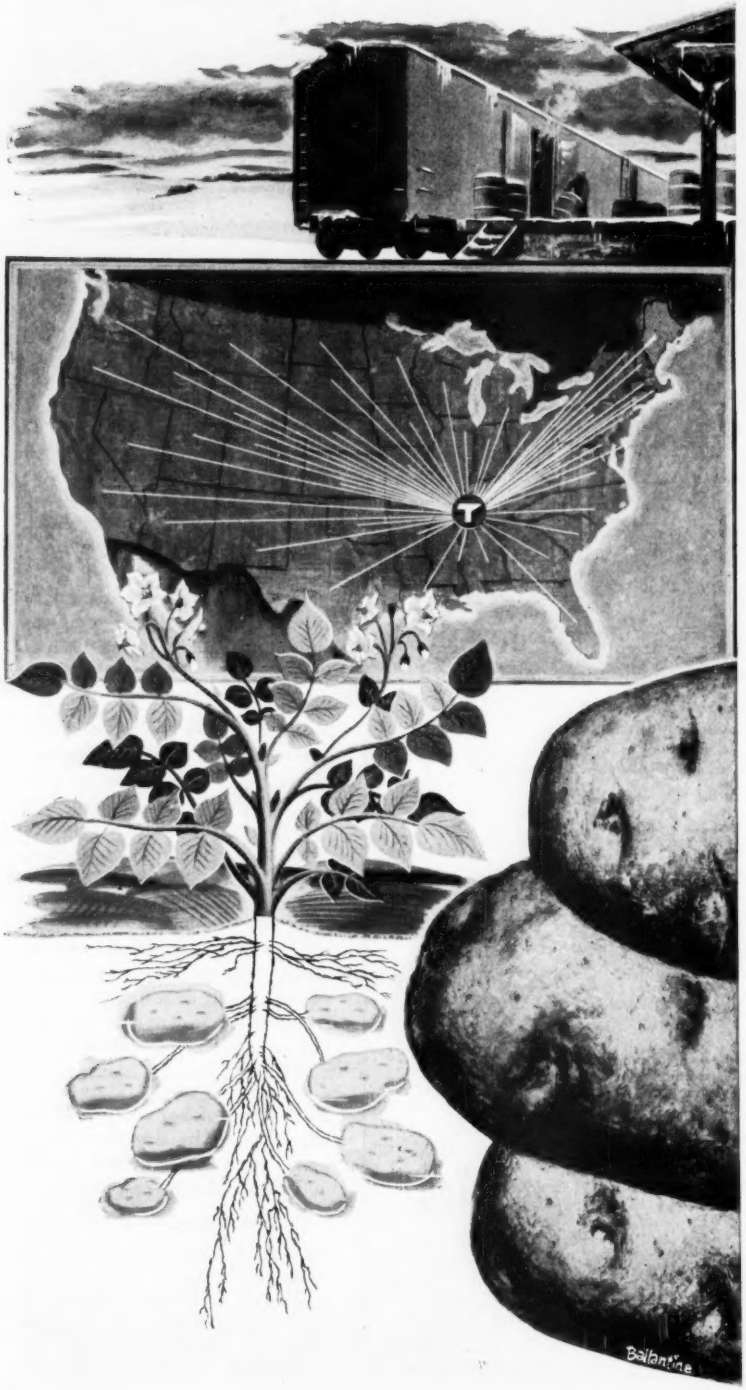
**Hydrocarbons** produced by the catalytic conversion of carbon monoxide and hydrogen are partially purified by extraction with ethylene glycol, which removes the oxygen-containing impurities.

**Polymeric** materials suitable for use as paint vehicles, coating agents for glass, and for insulation of electrical conductors result from the reaction of ethylene glycol with carboxyphenylsiloxanes.

**Synthetic rubber** scrap may be regenerated by devulcanizing, masticating with ethylene glycol, and then refining the product.

*These developments are abstracted from recent publications or U. S. patents. They may suggest applications of Jefferson Ethylene Glycol in your products or processes.*

# THERE'S A TOUCH OF TENNESSEE IN MAINE POTATOES




*Like many other fruits and vegetables the famous Maine Potato must be protected from freezing while in shipment. Tennessee's charcoal provides the necessary warmth.*

*Tennessee also contributes to the manufacture of fine margarines which bring out the flavor of Maine potatoes so well.*

*Tennessee's products are used by industry and agriculture throughout the country . . . in every state from Maine to California.*

*That's why Tennessee is known from Coast to Coast as an industry serving all industry.*

**TENNESSEE**
**PRODUCTS & CHEMICAL**
*Corporation*
NASHVILLE, TENNESSEE

*Producers of:* FUELS • METALLURGICAL PRODUCTS • TENSULATE BUILDING PRODUCTS • AROMATIC CHEMICALS WOOD CHEMICALS • AGRICULTURAL CHEMICALS

RUG SCRUBBERS: Specialties makers cleaning up on an old chore.

# The Midas Touch

A chemical specialty, a rug cleaner, is the latest product to be praised in *Reader's Digest's* Reports to Consumers.

Awakened public interest in home carpet care means big profits for the makers of chosen Glamorene, probably hearty gains for others, even those of different formulation.

Grumblings are heard in certain quarters, though: Was plugging one product fair, and were the tests which resulted in Glamorene's choice sound?

**There's a pocket-sized magazine** that from time to time recommends certain products to its six million readers. Latest to be tapped for the exclusive circle by this magazine, the *Reader's Digest*, is a rug cleaner called Glamorene (Jerclaydon Inc., Miami Beach).

For Jerclaydon, Glamorene's being chosen means practically a side door to Fort Knox. Gross sales to distributors totaling $4 million are hoped for this year, and judging from the success of products picked in the past, it seems likely that expectations will be realized.

But if Glamorene's good fortune brings joy to its maker, that same luck arouses a variety of emotions in producers of rival products and others in some way concerned with carpets and their care. Varied reactions must be expected in such cases.

A certain amount of envy is doubtless felt by competitors whose products were not mentioned. Nevertheless, they will probably not suffer; they won't get the gravy Glamorene will, but the publicity should do the business good. And the business could use a shot in the arm: One estimate by a professional carpet cleaner is that only 10% of the potential market has been tapped. Jerclaydon puts it this way: A department store might have sold a gallon of cleaner a week; now Macy's has disposed of as much as three carloads* in nine days.

But with professional rug cleaners, there is a more serious reaction to the *RD* article. They question the soundness of the tests conducted by York Research Corp. to evaluate Glam-

* From 4,500 to 6,000 gallon cans.

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STEAM DISTILLED WOOD TURPENTINE
Attractive Pint, Quart, Gallon and 5 Gallon Containers
Tank Cars

LIMED ROSINS
Calbrite, FF-L-45

ESTER GUMS
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PALE WOOD ROSINS
All Grades X to K

BEREZ
A dark wood resin available in solid or solution

GLOSS OILS
Gloss Oil 60
Gloss Oil 65

MALEIC MODIFIED ESTERS
Crosby 1015, 1016, 1417, 1418

*All Pale Rosins and Resins Available in New Type Light Tare, Scrap Value, Aluminum Drums.

CROSBY CHEMICALS, INC.
DE RIDDER, LOUISIANA
Plants: Picayune, Miss., and De Ridder, La.
REPRESENTATIVES IN ALL PRINCIPAL CITIES

FOAM'S A FRAUD . . .
KILL IT WITH

DOW CORNING
ANTIFOAM A

One part per million of Dow Corning Antifoam A kills foam during caustic soda concentration . . .

One part per million kills foam during synthetic varnish resin processing . . .

As little as 0.03 parts per million kills foam during tar evaporation . . .

And just three parts per million kills foam during strawberry jam concentration.

Odorless, tasteless, and relatively inert physiologically, Dow Corning Antifoam A is effective in a wider variety of foamers than any other material known—and in only trace quantities. That kind of efficiency has made it the most economical as well as the most versatile defoamer on the market.

See for Yourself

DOW CORNING SILICONES

Send COUPON Today for Your FREE SAMPLE

Dow Corning Corporation
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Midland, Michigan

Please send full information and a free sample of Dow Corning Antifoam A.

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ATLANTA • CHICAGO • CLEVELAND • DALLAS
LOS ANGELES • NEW YORK • WASHINGTON, D.C.



orene, and suggest the efficiency of the cleaner might be less than stated.

**Difference of Opinion:** Among professional carpet men, no group is as yet prepared to make a public statement. They say privately, however, that results of tests conducted by them don't jibe with those of York, and that they may make a public protest when they have done further work.

The complaints follow these lines: Rugs soiled by day-to-day use will not be cleaned by Glamorene—at least not any better than other products in the field—and that while effective for removing specific types of soil, Glamorene cannot clean and brighten the ordinary living room rug. It has also been suggested that Glamorene may be toxic because of the chlorinated solvent (probably trichlorethylene) used.

York counters that its testing was done according to procedures set up by the joint work of the Carpet Manufacturers Association, the National Institute of Rug Cleaners, and itself; that its results are confirmed by others, including members of the American Hotel Association, and by the Skouras theatre chain; and further, that the concentration of chlorinated solvents is below levels the Government considers dangerous.

**The Blessing:** Just how much a good word from *Reader's Digest* means is easily illustrated. Johnson's Carplate was one lucky recipient, and it was regarded as the outstanding chemical specialty of 1950. But Johnson's is a large firm; the effect is more striking with a smaller company, and an example there is provided by the case of a special faucet washer plugged last October.

Snap Products Co., (Syracuse, N.Y.) was one maker of the recommended item: Within two weeks' time business had shot up 350-400%; where two people could make the required washers, 10 were needed. And the sales remained high. A slump at Christmas (faucet washers are difficult to gift-wrap) was followed by resurgence in January, and the demand has continued.

Aware of the importance of its okay, *RD* notified Jerclaydon in November that Glamorene would be praised in February. (Snap Products got a three week warning.) *RD* also got a written agreement that mention of the article would not be made by Jerclaydon in its ads.

No agreement, however, specified that distributors or retailers could not refer to the article—apparently through *RD* oversight.

Already things are booming at Jerclaydon. A second plant, in addition to the one in Miami Beach, is under way in Connecticut. It has a capacity of 45 carloads per week, and should be in production within four weeks. Sales at Macy's, as mentioned, and at Gimbels in Philadelphia—8000 cans in one week—have demanded it. Jerclaydon hopes to put a can of Glamorene in the hands of every other U.S. housewife within six months.

Jerclaydon has even gone to the extent of designing a special brush for use with its product, is having it made by several brush companies.

**Formulation Facts:** Several types of carpet cleaners are on the market. For on-location work, where the interest is now, professional cleaners generally use a foaming, lather sort of compound, applied with a scrubbing machine. The foam permits using water to remove soil, but lessens the chance of soaking the rug (which sometimes leads to molding). After the rug has been scrubbed, the foam is sucked up in a vacuum cleaner-like machine.

Typical mixtures of the foaming sort—which can be applied by the housewife—contain sodium lauryl sulfate and sodium sesquicarbonate or sodium metasilicate. Sometimes soaps, rather than detergents, are used but the synthetics appear to offer the advantage of rendering the carpet less susceptible to resoiling.

Absorbent preparations, like Glamorene, depend on a powder or similar carrier to apply the grease solvent and detergent to the rug pile. These cleaners are spread on the rug, worked in with a brush, then removed with a vacuum when the solvent has dried.

Finely milled hardwood fiber—sawdust—appears to offer advantages of a carrier in that it is not dusty, doesn't lump, is easy to remove. Stoddard solvent and carbon tetrachloride or trichlorethylene are often incorporated as solvents for grease soils; synthetic detergents are mixed in, too. At least one product (McCann Roy's Roy Instant Carpet Cleaner) contains zinc silicofluoride as an antimoth agent.

Among makers of home cleaners, there seems to be no rush to match Glamorene's formulation. One producer whose product now has a powder carrier, is experimenting with a fiber one. For the most part, makers are hesitant about changes.

None in the trade will attempt to evaluate the benefits of an *RD* recommendation, but there is one thing fairly clear: When the *Digest's* Editor DeWitt Wallace decides to approve a product, it means bucks for the chosen company. Specialties makers are asking, "Who's next?"

## Dolcin Scold

**The Federal Trade Commission** has filed an initial decision (made by Hearing Examiner Abner Lipscomb—it will be the Commission's decision if not appealed within 30 days) prohibiting the makers of the medicinal preparation Dolcin from claiming it is a cure and effective treatment for arthritis, rheumatism, and "growing pains."

Further, it can no longer be represented as being economical, at $2 per hundred tablets. FTC says the only active ingredient is aspirin, and same quality, well known brands of aspirin sell for 59¢ per 100 tablets, or less.

## OPS Clarifies

**Cosmetics makers,** confused by the Federal Trade Commission rulings effective this month, have just received a clarification. The rule that baffled them was one declaring it unfair for a cosmetic manufacturer to pay advertising or promotional allowances to or for the benefit of a customer unless such payment is made available on proportionally equal terms to all customers competing in the distribution of a manufacturer's product.

Interpretation 47, Section 9, GCPR explains it this way: The cosmetic maker is not required to continue the promotional allowance if it was not part of the terms or conditions of the sale, or if it was allowed for services actually rendered by the customer for benefit of the manufacturer's product.

Further, the cosmetic maker need not continue the promotional allowance for ads which represent reasonable payment for reciprocal services, or reimbursement, in whole or in part, of the cost of the customer's advertising of the maker's product.

But if an allowance was granted with no stipulations that services be rendered by the customer, then OPS considers it a price discount, even though it is phrased as a "promotional" or "advertising" allowance. In such cases, the maker must continue the allowance if he gave it during the base period.

## To Beat Feet Fungus

**Cutter Laboratories, with Undesilin,** is angling for a cut of the $35 million bill Americans foot each year for athlete's foot cures. Still in the test market stage (11 western states and Texas), the new formulation contains 1% copper undecylenate, 10% sodium undecylenate and 5% undecylenic acid in a Carbowax base. Undecylenic acid has fungicidal properties; copper ion is a specific for ringworm. The combination in ointment is offered as a cure for both.

Undesilin powder, 10% zinc stearate in a talc base, is a companion foot powder. Ointment, in 1-oz. jars, and powder, in 2-oz. cans, both retail at $1.35

The newcomer in the athlete's foot cure business faces rough competition from both prescription and over-the-counter items. In addition to many other types of remedies, Cutter will vie with Wallace & Tiernan's well-established Desenex, also formulated with undecylenic acid.

## Spec Steaming Stopped

**Clar-Vew, a non-silicone lens tissue,** has been introduced in the Chicago area by Davis Products (Chicago). The sheets (12 for 19¢), impregnated with a neutralized mixture of sodium oleate and sodium alkyl napthalene sulfonate, are claimed to keep glasses fog-free 24 hours.

The tissues were devised by Davis Products to meet demands for glasses-wearing steel mill workers. (Company chief Davis is a steel mill chemist.) These men complained that glasses steamed up when they went outside from the hot furnace areas. Using the new sheets, bespectacled hands can move from a cold to a heated area or vice versa, without such trouble, Davis says.

For the present, tissues are being sold in stores handy to the steel mills.

Another problem with which Davis was familiar led to his development of Zom-Zare, a mosquito repellent (ethylhexanediol and other ingredients) likewise applied to tissues. Packages of 12 sheets for 50¢ have been selling well to mosquito-plagued fishermen; distribution has been through Midwest sports-goods stores and mail-order, but national sales are contemplated for both Zom-Zare and Clar-Vew.

•

**New at Johnson:** S. C. Johnson & Son, Inc., has developed and test marketed a new chromium cleaner, for use on auto bumpers and the like. Said to clean and offer protection too, Johnson's Chrome Cleaner will be introduced in a "three for two" plan—buying both Carnu and Carplate entitles the customers to an eight-oz., 50¢ can of the cleaner.

Glo-coat, Carnu, and Carplate will be made overseas by two firms, under arrangement with Johnson. Hill & Murray, Ltd., in Johannesburg, South Africa, will make the products from

Handle mineral acids and hydrofluoric acid safely! Lift this container by its ring handle . . . pour the contents easily through the drip-proof spout.

Perfect container for expensive oils and extracts...it's impervious to mineral acids also hydrofluoric acid up to 60%. One gallon capacity. Shipped with both a screw cap and drip-proof polyethylene spout.

TEST IT! SEND FOR SAMPLE TODAY!

Complete $10.00—Special Quantity Discounts

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**W. Miller Cook Associates Inc.**
**Union Commerce Building**
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A PRODUCT OF THE STEEL CITY MFG. CO.

*Go the scientific way...go* **MGK**

***Insecticide Concentrates for***

**AEROSOLS**

**DUSTS**

**SPRAYS**

**We** offer *complete formulas* . . . ready to put right into your aerosol bombs or your retail packages or . . . *combinations* of insecticides and synergists that leave you only the minimum of processing to do or . . . the purest toxicants and synergists *in their primary forms.* MGK has the *best* of whatever you want.

*Scarabaeus sacer*
*Sacred beetle*
*Model for Egyptian carved stone amulets and scarabs.*

THE PIONEERS OF PYRETHRUM AND ALLETHRIN

*For complete information write 1709 SE 5th St., Minneapolis, Minnesota*

**McLAUGHLIN GORMLEY KING COMPANY**

# BICARBONATE of SODA
# MONOHYDRATE of SODA
# SAL SODA

## STANDARD QUALITY

**CHURCH & DWIGHT CO., INC.**

***Established 1846***

**70 PINE STREET** **NEW YORK 5, N. Y.**

**KESSCO PRODUCTS** CHEMICAL SPECIALTIES

If you are seeking permanent flexibility, heat stability, water resistance, good hand, drape and resilience in your resins,

**INVESTIGATE**

**BUTYL CELLOSOLVE* STEARATE**
**LAURATE OLEATE**
**Primary Plasticizers**
**for**
**Nitrocellulose, Ethyl Cellulose**
**Polystyrene, Synthetic Rubbers**
**Secondary Plasticizers**
**for**
**Polyvinyl Chlorides and Copolymers**

* Trademark of C. & C. C. Div.

**KESSLER CHEMICAL CO., INC.**
ESTABLISHED 1921
STATE ROAD and COTTMAN AVE. PHILADELPHIA 35, PA.


## SPECIALTIES . . . .

raw materials; Norsk Kjemikalie and Sandivka Kjemiske, Oslo, Norway, will produce them from "bases" made in the Johnson plant in England. More Johnson products will be tried later.

•

**St. Louis Fire:** A fire, causing damage estimated at nearly $1 million, destroyed the warehouse of the California Spray-Chemical Corp, near St. Louis. Stock of 33,000 pounds of DDT and various solvents was lost.

•

**Arkansas Soap:** Basco, a waterless hand-cleaner for mechanics and printers is being made in Nashville, Ark., by newly organized L & H Chemical Laboratories. It will be sold retail, and through jobbers.

•

**Pratt & Lambert Purchase:** Pratt & Lambert, Inc., has purchased the Salt Lake Glass & Paint Co., (Salt Lake City, Utah) through an exchange of stock. The firm will continue to operate under the old name.

•

**Naco's Newest:** Nurish, a concentrated water soluble plant nutrient, will mark the entry of Naco Fertilizer (subsidiary of W. R. Grace) into the water-soluble plant food field.

•

**More Colors:** Acheson Industries, Inc., will expand activities in pigment dispersions with the acquisition of two Philadelphia firms, Peerless Printing Ink Co. and Synthetic Lacquer & Varnish Co. The two properties will be combined and operated under the Peerless name.

•

**Velsicol Operates:** Operation of the Memphis, Tenn., Arvey plant has been taken over by the Velsicol Corp., an Arvey subsidiary. Chlorine and soda ash are produced, and operation of the new 2 million dollar heptachlor addition has begun.

•

**Aerosol Spray Valve:** Aeropak, Inc., (Chicago) has just made generally available a new valve for aerosol-packaged protective coatings—self-spraying touch-up paints. Valve is said to be specifically designed for spray coatings, rather than an adapted insecticide valve.

**PICTURES IN THIS ISSUE:**

p. 40—Oronite Chemical Co.; p. 47—Dow Chemical Co.; p. 51—Cleanliness Bureau.

# BOOKS . . . . . .

**The Chemistry of Lignin,** by Friedrich E. Brauns. Academic Press Inc., New York, N.Y.; 808 pp., $14.50.
A study of lignin from the research standpoint reviews literature on the subject and in doing so examines varying theories on the structure of lignin, reports on what happens to the substance when it undergoes different types of reactions.

**Plastics Molding** by John Delmonte. John Wiley & Sons, Inc., New York, N.Y.; 493 pp., $9.
Isolating the basic principles of molding from its usual context of the entire plastics industry, the author analyzes the plastics molding industry —its equipment, materials and techniques. Illustrated.

**FBI Register of British Manufacturers, 1951-52,** 24th edition. Published for the Federation of British Industries, by Kelly's Directories Limited and Iliffe & Sons Limited Dorset House, Stamford St., London S.E.I. 882 pp. $6.
Published with a view to promoting Britain's export trade, volume can serve as an export reference book to British industry; it is classified in English, French and Spanish and contains sections on products and services, addresses, and advertisements.

**Elements of Ceramics,** by F. H. Norton. Addison-Wesley Press, Inc., Cambridge, Mass.; 246 pp., $6.50.
Book discusses principles of ceramics, using an approach based on unit processes rather than products themselves; visual education methods supplement the text.

**The Chemistry of Synthetic Dyes,** Vol. I, by K. Venkataraman. Academic Press Inc., New York, N. Y.; xvi+704 pp., $14.50.
Primarily a research book, this volume investigates the chemical structure and synthesis of dyes from the viewpoint of modern organic chemistry—with the intention of spotlighting fundamental research problems in the field.

**German-English Medical Dictionary,** by Louis De Vries. McGraw-Hill Book Co., New York, N. Y.; ix+586 pp., $12.
Designed for medical men whose knowledge of German is on the college level. The dictionary contains 40,000 entries.

**Thiophene and its Derivatives,** by Howard D. Hartough. Interscience Publishers, Inc., xvii+533 pp., $16.50.
The third of the series of monographs published under the collective title, "The Chemistry of Heterocyclic Compounds," with Arnold Weissberger as consulting editor. Treatise attempts to cover all phases of thiophene chemistry, with special chapters on pharmacological and spectrochemical aspects written by experts in these fields rounding out the subject.

**Absorption and Extraction,** second edition, by Thomas K. Sherwood and Robert L. Pigford. McGraw-Hill Book Co., New York, N.Y.; ix+478 pp., $7.50.
Second edition covering the theory, design procedures, and performance data relating to mass transfer between phases.

## Briefly Listed

CHARCOAL PRODUCTION AND USES, 101-page report reviewing papers and discussions on the subject of charcoal—all of which took place at a conference held at Durham, N.H. in Sept., 1951. Interested in charcoal production as one method of utilizing low grade wood, the papers stress scarcity of charcoal supply and outline recent improvements in production. Northeastern Wood Utilization Council, Inc., P.O. Box 1577, New Haven, Conn.; $2.

# MEETINGS . .

**Manuf. Chemists' Assn.,** air pollution abatement conf., Statler Hotel, N.Y., Feb. 25-26.

**Drug, Chemical & Allied Trades Section of New York Board of Trade,** annual dinner, Waldorf-Astoria Hotel, N.Y., Mar. 6.

**Natl. Assn. of Corrosion Engineers,** annual conf. & exhibition, Buccaneer Hotel, Galveston, Mar. 10-14.

**Natl. Farm Chemurgic Council,** annual conf., Statler Hotel, St. Louis, Mar. 11-12.

**Soc. of Plastics Ind., Inc.,** national plastics exposition, Convention Hall, Phila., Mar. 11-14.

**Amer. Inst. of Chem. Engineers,** Atlanta Biltmore Hotel, Atlanta, Mar. 16-19.

**Coml. Chem. Dev. Assn.,** annual open meeting, Statler Hotel, N.Y., Mar. 20.

**Chicago Intl. Trade Fair,** Navy Pier, Chicago, Mar. 22-April 6.

**Natl. Sanitary Supply Assn.,** convention, Conrad Hilton Hotel, Chicago, Mar. 23-26.

**Amer. Chem. Soc.,** national meeting, Buffalo, Mar. 23-27.

**Packaging Machinery Manufacturers Inst.,** semi-annual meeting, Dennis Hotel, Atlantic City, Mar. 30-31.


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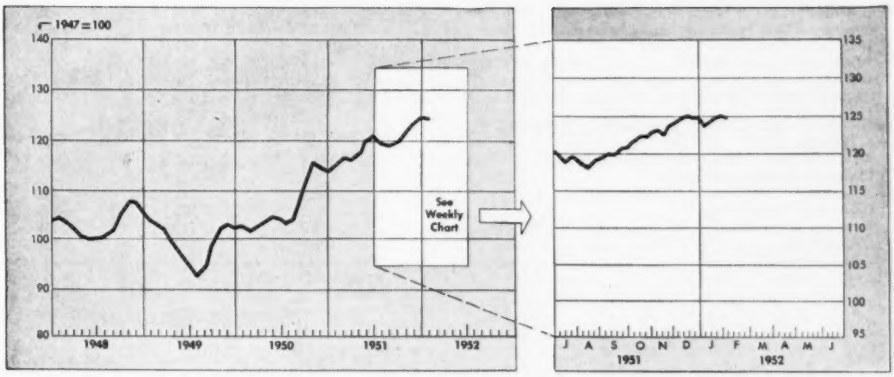
# MARKETS . . . . . .




CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries

## MARKET LETTER

If getting cellophane is your biggest problem, you're lucky. Sulfur shortage or not, Du Pont has this week discontinued allocations—in effect since 1949—of this film.

Three reasons are back of this move. Increased production has come in during the past year, economies have been worked out in carbon bisulfide use, and other film types have come up fast to move in on this market. Sales of these others in 1952 should top $100 million, double the output in 1950.

So long as defense needs for carbon bisulfide are met, NPA is willing to stay its hand on allocations. These favored uses will get NPA's support: rubber accelerators, high tenacity rayon, flotation agents, grain fumigants and pesticides. Cellophane and textile rayon will get what's left. Excluded from curbs: carbon tetrachloride, provided the sulfur recovered in the process is returned for recycle.

With the two latest additions of copper sulfate and paper base stocks, there are now seven "unlimited" export items on which OIT retains the right to restrict quantities. Reason: past outsize speculation.

All applications for copper sulfate, for example, must cover the record of shipments abroad during 1949 and 1950.

Chemical bargain-hunters this week were gladdened by three price concessions. Du Pont trimmed prices on fully hydrolyzed grades of polyvinyl alcohol from 81¢ to 72½¢ a pound in ton lots to pass along the economies of improved processing. United Research Laboratories whacked 60% from its ACTH price for the same reason. Capryl alcohol, a wallflower in the drive for more sebacic acid output, dipped for the third time in six months. The latest slice: from 20¼¢ to 15¢ a pound for the 95% grade, as a leading producer, Rohm & Haas, tries to find a bigger market at a stable price level.

Bleachers of pulp in the Pacific Northwest got off to a fast start in the use of hydrogen peroxide. Buffalo Electrochemicals just shipped the first tankcar from its new plant at Vancouver, Wash. The first customer: Westminster Paper Co. at New Westminster, B.C. This news will only whet the interest of Southern pulpers who will be looking for Du Pont's peroxide output late this year from the abuilding Memphis plant.

| WEEKLY BUSINESS INDICATORS | Latest Week | Preceding Week | Year Ago |
|---|---|---|---|
| Chemical Industries Output Index (1947=100) | 124.6 | 124.8 | 115.0 |
| Bituminous Coal Production (Daily Average, 1000 Tons) | 1,764.0 | 1,733.0 | 1,408.0 |
| Steel Ingot Production (Thousand Tons) | 2,090.0 | 2,079.0 | 1,989.0 |
| Wholesale Prices—Chemicals and Allied Products (1926=100) | 132.7 | 132.5 | 147.2 |
| Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.) | 235.7 | 237.4 | 227.0 |
| Chemical Process Industries Construction Awards (Eng. News-Record) | $18,712,000 | $13,778,000 | $19,231,000 |

| MONTHLY INDICATORS—WHOLESALE PRICES (1926=100) | Latest Month | Preceding Month | Year Ago |
|---|---|---|---|
| All Commodities (Other than Farm and Foods) | 166.9 | 166.9 | 166.7 |
| Chemicals and Allied Products | 137.9 | 138.7 | 139.6 |
| Chemicals | 144.5 | 144.7 | 136.1 |
| Drugs and Pharmaceuticals | 169.0 | 169.1 | 175.1 |
| Fertilizer Materials | 123.2 | 122.4 | 115.6 |
| Oils and Fats | 126.1 | 132.0 | 180.6 |

The talk of a possible over-supply of fixed nitrogen in the next couple of years is of minor concern to one major producer. Allied Chemical and Dye's V. P. Miller told Wall Street Security Analysts last week that he counts on the Midwest to take up a large portion of the added output as fertilizer, eventually to approach the South's top-customer rating. Added factor: Some ammonia plants are getting well along years, might not be replaced if demand falls off.

The wax business by next year should see more competition, more price stability, less dependence on imports. By then, commercial quantities of Semet-Solvay's polyethylene wax are expected. This synthetic will go after some of the carnauba markets, and also be used to modify paraffin in, for example, automatic wax-coated packaging.

More plastics are putting out to sea. The Navy—trying to conserve metals and money—is now sold on plastic piping after 8 months of testing on a destroyer escort. As a result, new minesweepers will use plastic pipe. Material saving: 2 tons of copper and nickel per minesweeper. Pentagon and taxpayer bonus: Installed cost is about halved.

Why not lift curbs on unbleached sulfate pulp at least until July 1? That poser has been put to NPA by the Industry Advisory Committee, which finds the supply more than ample. Chances are controls will be relaxed some, but supplies of unbleached sulfate are still too spotty to give buyers a free hand.

Special synthetic rubber will continue under inventory control, but limits are off for GR-S. Reasons: better supplies, a bulging RFC stockpile. And there is good measure for tire makers: More high tenacity rayon cord has become available. Capacity for this fiber will be up to 400 million pounds yearly within a month, a 75 million pound boost since last July.

Partly because of the becalmed textile business—marked this week by an 8¢-a-pound tumble for acetate staple—and partly because of supply problems, rayon raw materials are moving into defense. Cases: High tenacity rayon tire cord can get carbon bisulfide; new explosives certainly won't lack for acetic anhydride.

**SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending February 18, 1952**

| | | Change | New Price | | Change | New Price |
|---|---|---|---|---|---|---|
| UP | Furfural (tanks) | $ .003 | $ .108 | Furfuryl alcohol | $ .005 | $ .195 |
| DOWN | Capryl alcohol, 85% | .04 | .135 | Carnauba Wax, No. 1 yel. | .03 | 1.15 |

**All prices per pound unless quantity is stated**

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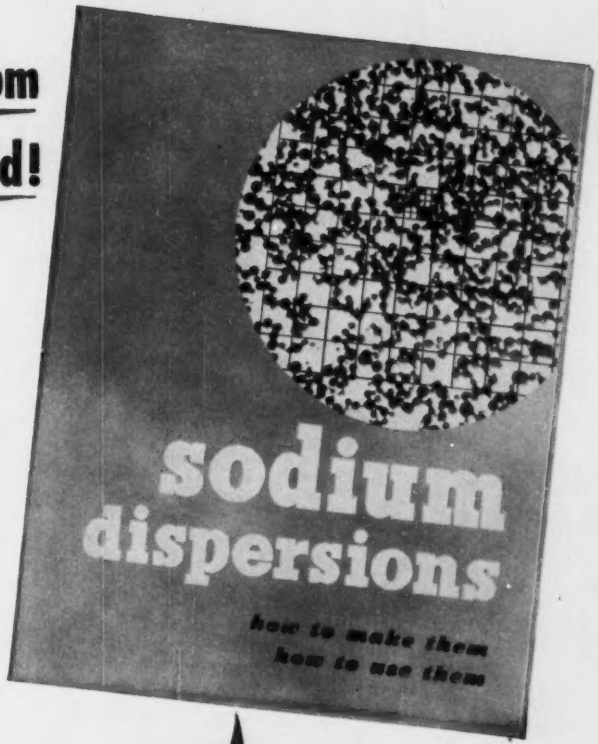


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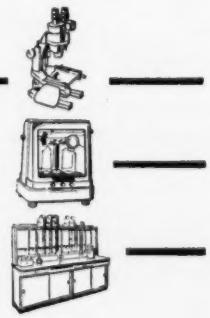

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# Bleachers Rewarded

Bleachers of groundwood pulp are ready to take output of two new hydrogen peroxide plants.

Peroxide for textile bleaching will continue to grow, but swifter gains are seen in chemical oxidations.

Improved processing and higher concentration will widen market horizons, eventually bring price down.

**Catch-as-catch-can buyers** of hydrogen peroxide will be getting a double windfall this year. Both of the major producers will add plenty to their capacity to take care of much of the unsatisfied demand.

One of them, Buffalo Electrochemical—recently acquired by Food Machinery—has just brought in a new peroxide plant at Vancouver, Wash. which will substantially augment its present output in the Buffalo, N.Y. area. The other, Du Pont, is running at full load in the latter location. It is now putting up a new plant at Memphis, Tenn. that should be completed in the latter part of the year. By the time both of these plants are in full swing, customers stand a lot better chance of getting their wants satisfied.

**Plans for Paper:** Already most peroxide buyers are making ready for the bigger supplies ahead. Among them, the pulp and paper industry—for several years a peroxide seeker—is planning and constructing new pulping units for peroxide bleaching of groundwood and high-lignin wood. For this use, peroxide bleaching appears to offer the industry a means of getting a light pulp with higher cellulose recovery and without deterioration of the fiber.

If the cost-conscious pulp industry had its way, this economical method would be put into operation as early as possible. So barring a hitch in these plans, this one application could very easily develop into the largest single industrial outlet. Although the two producers are not putting all their eggs in this one basket, the proximity of the new plants to vast pulping operations in the Northwest and South is no mere coincidence.

**Need To Concentrate:** Both of these new units, significantly, will be able to make a high-strength product (50%) needed for pulp bleaching. But in addition, some other sure-to-grow outlets will be after high concentration peroxide, and it pays to be forehanded about these things. For instance, many have been itching to use hydrogen peroxide as an oxidizing agent in some larger-scale organic reactions.

It is one of the neatest methods of converting olefins into epoxy compounds and glycols. Yields are extremely high, and purification problems are simple compared with oxidation with air or oxygen. While it isn't likely that peroxide will be competitive for say, oxidizing natural gas, the combination of these uses could conceivably make a strong bid for top peroxide taker. That time may yet be some years away, but it is mention-worthy that at least three well-known chemical companies are now buying tankcar loads of hydrogen peroxide; they weren't doing so last year.

**Beckoning Stronger:** Some of these —and other—applications undoubtedly include the manufacture of epoxy, hydroxy, and peroxy compounds. For instance, epoxidation with peroxide is now used to make the insecticide dieldrin. Hydroxylation of a wide variety of organic intermediates and steroids finds increasing favor. In addition, a large number of organic peroxides—including many tonnage items—are growing up rapidly as polymerization catalysts, particularly for cold rubber.

Peracids, also obtainable from hydrogen peroxide, are tagged for a bright future. One example: use as germicidal acid detergents in cannery operations, both in washing of fruits and vegetables, and also in the cleaning of processing equipment. Becco's West Coast plant would be in a good spot to supply the potential heavy demand in that area.

Rapid gains in relatively new fields don't hide the fact that textile bleaching is currently the biggest taker of hydrogen peroxide. Peroxide is the material used on probably over two-thirds of all textile yardage bleached. Besides the two major producers, both Pennsylvania Salt and Westvaco Division of Food Machinery are doing a thriving business in selling most of their output for this purpose. Du Pont's new plant at Memphis will be in an enviable location for handling a lot of new business from the mushrooming Southern textile industry.

**Cash Carries:** Riding the crest of these uptrends, hydrogen peroxide gives more than token indications of widened market territory. The perborate powder bleaches, peroxide-derived, can absorb a longer haul because of the high-active content. Another trend that may well prove feasible when supplies improve is the shipment of high-strength peroxide solutions to distant points, repackaging as a liquid bleach. This move of course would be in direct competition with the hypochlorite bleach business, which is highly decentralized to save freight.

What the outcome of these competitive developments will be depends in no small degree on the eventual selling price for peroxide. In the next year or two, hydrogen peroxide producers will doubtless have their hands full with the heavy demand near plants and some of the larger existing industrial markets. But as new and farther-off uses reveal themselves, and with improved processing tending to whittle prices, the hydrogen peroxide industry in not too many years will be a multiple of itself today.

## Case on Castor

**Castor oil processors this week were looking at the latest price decrease on capryl alcohol as a clue to future changes in castor oil distribution.**

For the third time in less than six months, Rohm & Haas dropped its price of capryl alcohol (octanol-2), a byproduct in making sebacic acid from castor oil. New listing on the 85% product: 13½¢ per lb. in tankcars.

While sebacic production probably didn't take more than 6 of the 84 thousand tons of castor oil produced in the U.S. last year, oil processors saw a bright opportunity to expand sales in that direction.

The Government, foreseeing increased war needs for castor oil, has (1) set a 10¢ per pound floor on payments to farmers for castor beans to encourage domestic production, (2) restricted use in protective coatings to 60% of base period use, (3) restricted export both of the beans and oil, and (4) stockpiled the oil.

As a result of these Government actions and of a short castor crop in Brazil last year, the price of the oil has jumped from 21¢ to 33.75¢ (tankcars). The Brazilian crop this year is expected to be as short as last, which means that prices are not apt to drop in the near future.

**Odds on Ends:** For "normal" times, the main use of castor oil and its modifications is in paints, varnishes and

lacquers. One industry expert gives this use pattern:

Protective coatings, 40%
Sulfonated castor oil, 6%
Automotive products, 10%
Synthetic leathers, 10%
Vinyl plasticizers, 7%
Pharmaceuticals and cosmetics, 5%
"Chemical" uses otherwise unspecified, and including production of sebacic acid, 12%
Miscellaneous uses, such as inks, paper, caulking compounds, insecticides, linoleum, not over 3% apiece.

Aside from castor oil itself, the biggest seller on a volume basis is dehydrated castor oil, which accounts for perhaps 25% of total production. This product is made by chemical dehydration of ricinoleic acid (85% of castor oil) to produce a conjugated linoleic acid with enhanced quick-drying properties.

The dehydrated material finds its primary use in alkyd resins and uniphase varnishes. While it is a near substitute for tung oil, demand is lessened because tung is now cheaper. A styrenated DCO also finds use in certain alkyds.

But though there is every chance for increasing use based on alkyd production boosts, oil processors still count hopefully on the stepped-up production of sebacic.

This jibes with the reduction of capryl alcohol prices by Rohm & Haas. R&H, not openly admitting to an oversupply of capryl, sees a continual growth for sebacic demand. Hence the price incentive for further use of this byproduct.

Though it is relatively higher priced than such diacids as adipic and azelaic, sebacic's major use in wartime would be in cold temperature lubricants (*CW, Sept. 1*). In normal times, much of the sebacic production would head into 610* nylon plastic, so overall consumption is necessarily tied to sales of this polymer.

Should demand for sebacic exceed, say, 25 million pounds per year, more could be synthesized at higher cost from petroleum-based materials. But the most feasible production route now is via castor oil. Discovery of a consistent, large-scale use for the capryl byproduct will smooth out the sebacic market bumps.

* "6" for 6-carbon hexamethylene diamine, "10" for 10-carbon sebacic acid. Fiber nylon (66) uses 6-carbon adipic acid.

## Government Needs

| Bid Closing | Invitation No. | Quantity | Item |
|---|---|---|---|
| **Commanding Officer, New York Chemical Procurement District, 180 Varick Street, New York 14, New York.** | | | |
| Mar. 6 | (CML-30-070-52-40B) | 385000 lbs | Soda, ash type V briquets in accordance with specification O-S-571B amendment 1 |
| **Commandant of the Marine Corps, Washington D. C. Attn: Supply Department Procurement Section** | | | |
| Mar. 7 | 804B | 70200 lbs | Acid, sulfuric, for storage batteries, in 13-gallon carboys, Class B, Fed. Spec. O-A-111 and amend |
| **Federal Security Agency, Public Health Service, Supply Branch, Division of General Services, Washington, D. C.** | | | |
| Feb. 25 | 7263 | 5 dr.<br>10 dr. | Glycerin/glycerol/550 lb<br>" |
| **Chief, U. S. Weather Bureau, Washington 25, D. C., Attn: Chief, Materiel Section** | | | |
| Feb. 25 | (INV. 60-WB-52) | 5100 ea. | Charges, aluminum chip and caustic soda for use with hydrogen generator PAA 1940 or ML-185 |
| **Chief, Procurement Section, National Bureau of Standards, Connecticut Avenue & Van Ness St., N. W., Washington 25, D.C.** | | | |
| Feb. 25 | (B-1-1484-52) | 7500 lbs | Saltpeter, granular |
| | (B-1-1482-52) | 7000 lbs | Potash, calcined, 99% |
| **Chief, Procurement Division, Supply Service, Veterans Administration, Washington 25, D.C.** | | | |
| Feb. 25 | A-91 | 5568 btl | Codeine phosphate tablets ½ gr. |
| | | 960 btl | Codeine phosphate tablets 1 gr. |
| Feb. 25 | A-91 | 7104 btl | Ascorbic acid tablets 1½ gr. |
| | | 4416 btl | Aminophylline tablets 1½ gr. |
| | | 360 btl | Ferrous sulfate tablets 5 gr. |
| | | 648 btl | Diphenyldantoin sodium capsules 1½ gr. |
| | | 768 btl | Glyceryl trinitrate tablets 1/100 gr. |
| | | 1512 tube | Glyceryl trinitrate tablets 1/150 gr. |
| | | 28800 pkg | Iodoalphionic acid tablets 7½ gr. |
| | | 2688 btl | Quinidine sulfate tablets 3 gr. |
| | | 216 btl | Quinidine sulfate tablets 3 gr. 500S |
| | | 312 btl | Thiamine hydrochloride tab. 1½ gr. |
| | | 240 btl | Thiamine hydrochloride tab. 1/6 gr. |
| **Business Service Center, Region 2, General Services Administration, 250 Hudson Street, New York 13, New York.** | | | |
| Feb. 26 | NY-3B-35888 | 180 gal | Sodium hypochlorite |
| | | 7000 lb | Sodium thiosulphate |
| | | 50000 lb | Trisodium phosphate |


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***Autoclave, 1 gal., glass lined, 500# Pr., Direct*** fired. Perry Equip., 1415 N. 6th St., Phila. 22, Pa.

***Autoclaves, Tile Lined. First Machinery Corp.,*** 157 Hudson St., N.Y. 13, N.Y.

***Boilers, International, 200 HP, 125 PSI. R.*** Gelb & Sons, Inc., Union, New Jersey.

***Calenders, New Rubber Calenders, 6x12", John-*** son joints, 7½ HP motor, Complete. Eagle Industries, 110 Washington St., NYC.

***Centrifugal, 36"x40", Bird, Continuous, Consoli-*** dated Products, 14-18 Park Row, N.Y. 38, N.Y.

***Centrifugals, Bird Rubber Covered. First Ma-*** chinery Corp., 157 Hudson St., N.Y. 13, N.Y.

***Condensers, Coil, St. St., 40 sq. ft. Perry Equip.,*** 1415 N. 6th St., Phila. 22, Pa.

***Dryer: 2—40"x43" J. P. Devine Vacuum, 5½"*** diameter observation window, ten heating shelves, approximately 255 sw. ft. heating surface—with Buflovak Condenser. L. Albert & Son, Trenton, New Jersey.

***Dryer, Buffalo Vacuum 20 shelf; 40"x44". First*** Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

***Dryer, Vacuum Shelf, 44"x44" shelves, MD*** pumps, complete. Eagle Industries, 110 Washington St., NYC.

***Dryers (4 Beaird 4'x27' gas-fired with blowers).*** Chemical & Process Machinery Corp., 146 Grand Street, New York 13, N.Y.

***Dryers, Stainless Drum 5'x10'. First Machinery*** Corp., 157 Hudson St., N.Y. 13, N.Y.

***Evaporator, Stokes, 625 gal. S/S 304 j'ktd &*** coiled. Chemical & Process Machinery Corp., 146 Grand Street, New York 13, N.Y.

## For Sale

***Evaporators, Multiple Effect. First Machinery*** Corp., 157 Hudson St., N.Y. 13, N.Y.

***Filter, 3'x2' Oliver Steel Rotary Vacuum. Equip***ment Clearing House, 289 10 St., Bklyn. 15.

***Filter, Sweetland #5, 29 leaves. Perry Equip.*** 1415 N. 6th St., Phila. 22, Pa.

***Filter, Vallez #49, 41 Stainless covered leaves*** 44½" dia. Late Type. Stein Equipment Co., 90 West St., N.Y. City. WOrth 2-5745.

***Filters, Sweetland, up to #12. First Machinery*** Corp., 157 Hudson St., N.Y. 13, N.Y.

***Filter Press, Shriver 24x24" cast iron, 40 cham***bers, open delivery, like new. Loeb Equipment Supply Co., 1922 North Ave., Chic. 22, Ill.

***Filter Press, 24"x24", aluminum, 24 chambers,*** Consolidated Prods., 14-18 Park Row, N.Y. 38.

***Filter Press, 30"x30", iron, Sperry, steam*** heated. 30 chambers, Consolidated Products. 14-18 Park Row, N.Y. 38, N.Y., Barclay 7-0600.

***Filter Presses, all sizes and types. Process In***dustries, 305 Powell St., Brooklyn 12, N.Y.

***Kettle, Stainless Mixing, 1,000 gals. with*** Nettco Drive. R. Gelb & Sons, Inc., Union, N.J.

***Kettle, Steel Jack., 1,000 gal. with agitator.*** R. Gelb & Sons, Inc., Union, N.J.

***Mill, New Rubber Mills, 6x12, 6x14, 6x16"; J***ohnson joints, Complete. Eagle Industries, 110 Washington St., N.Y.C.

***Mill tube Hardinge 4'x14'6" Belgian block*** lined. Chemical & Process Machinery Corp., 146 Grand Street, New York 13, N.Y.

***Mixer, Lab BP Vacuum, 17 gal, jktd, MD, Com***plete. Eagle Industries, 110 Washington St., NY.

***Mixer, 110 gal. stainless Patterson Vacuum,*** Consolidated Prods., 14-18 Park Row, N.Y. 38.

***Mixer, 200 gallon B.P. Jacketed, m.d., Con***solidated Products, 14-18 Park Row, N.Y. 38.

***Pebble Mills; 8'x8', Porcelain lined. First Ma***chinery Corp., 157 Hudson St., N.Y. 13, N.Y.

***Pulverizer, Mikro #1 SH & #2 TH. R. Gelb*** & Sons, Inc., Union, New Jersey.

***Pulverizer, Raymond High Side 5 roll, Consoli***dated Products, 14-18 Park Row, N.Y. 38, N.Y.

***Pulverizers, Mikro #3 & 4 also Atomizer #6*** Equip. Clearing House, 289 10 St., Bklyn. 15.

***Tablet Press, Stokes DD2, 23 punch, Consoli***dated Products, 14-18 Park Row, N.Y. 38, N.Y.

***Tank, 5700 gal., S/S, Horiz., New. Perry Equip.,*** 1415 N. 6th St., Phila. 22, Pa.

***Tank. New 20,000 Gal. Cap. 5/16 Steel 6 avail***able. L. M. Stanhope, Rosemont, Pa.

***Tank, S/S, 3,000 gal. for truck. Perry Equip***ment, 1415 N. 6th St., Phila. 22, Pa.

***Tank, Stainless steel 3000 gal. vert. closed.*** Loeb Equipment Supply Co., 1922 North Ave., Chicago 22, Illinois.

***Tanks, Steel, 8,000 gals. to 16,000 gals. R.*** Gelb & Sons, Inc., Union, New Jersey.

***Tanks, 2 10,000 gal. SS Storage Tanks, practi***cally new. Eagle Industries, 110 Washington, NY.

***Tanks, SS, from 180-3500 gal, jktd., storage,*** agitated. Eagle Industries, 110 Washington, NY.

***Tanks, S.S. Storage & Mixing, all capacities.*** Process Industries, 305 Powell St., B'klyn 12.

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***Machinery, Chemical and Process. Everything*** from single item to complete plant. Consolidated Products, 18 Park, N.Y. 38.

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# BOOKLETS . . . . . .

## Chemicals

### Ethylene Oxide Condensates

8-p. brochure describing the firm's line of surface active chemicals when used as wetting agents, detergents, emulsifiers, leveling agents and spin bath additives. A 2-page section dealing with the identification and selection of the chemicals contains a large chart detailing the properties of the various ethylene oxide condensates, in addition to notes on ionic activity, fatty components, and water solubility. Nopco Chemical Co., Harrison, N. J.

### Neoprene-Treated Paper

12-p. technical bulletin explaining the nature of neoprene and its development, goes on to discuss the advantages and properties of paper pulp treated with neoprene rubber latex; noted are tensile strength, elongation, bursting strength, impact and shock resistance, chemical resistance, internal bond strength, etc. An application table is also included. E. I. du Pont de Nemours & Co., Wilmington, Del.

### Colloids

2-p. technical bulletin supplying details of general description, molecular makeup and useful properties of firm's new line of products, which consist of basically refined hydrocolloids obtained from sea plants, and finding application in gelling, binding, bodying, thickening, suspending, stabilizing, modifying and precipitating processes. Seaplant Chemical Corp., 63 David St., New Bedford, Mass.

### Resin-Rosin Sizing

Booklet outlining characteristics, preparation and use of "Mersize RM," a blend of synthetic sizing and resin, finding application in the paper industry. Monsanto Chemical Co., Boston, Mass.

## Equipment

### Leaded Copper-Base Alloys

Reprint of three articles by J. Kura, L. Eastwood, and J. Doig devoted to the subject of the "correlation of structure and test-bar properties of 85-5-5-5 alloy." Brass and Bronze Ingot Institute, 308 W. Ashington St., Chicago, Ill.

### Packaging Materials

Booklet entitled, "How Aluminum Can Save Tin," outlines packaging methods and materials, to be utilized with a view to the replacing of tin. Discussed as new packaging materials here are "Reyseal," a combination of foil, paper and wax and other varying combinations of paper, foil, cloth and plastics. Reynolds Metals Co., 2500 So. Third St., Louisville, Ky.

### Force Draft Oven

Bulletin covering features, models, specifications, and construction details of forced draft electric utility ovens designed for analytical and general chemical work involving baking, drying, conditioning, preheating and other jobs. The Emil Greiner Co., 20-26 N. Moore St., New York, N. Y.

### Control Thermometers

4-p. specification sheet reviewing models, specifications, instrument assemblies and control forms for control thermometers, with snap-acting electric contact control furnished as eccentric scale indicators and one or two-pen recorders. Minneapolis-Honeywell Regulator Co., Philadelphia, Pa.

### Litmus

4-p. wholesale price list noting prices of litmus, special test-papers and indicators. American Indicator-Paper Co., 4611 N. Kostner Ave., Chicago, Ill.

### Temperature Controls

52-p. catalog covering firm's temperature controls explains basic operating principles, heat sensitivity, selection and application details, modifications, special features, protective wells and temperature test kit in addition to describing the design, operating characteristics and installation of each of ten variations on the basic thermostatic device. Dimensional drawings, photos, graphs and tables supplement the text. Fenwal Inc., Ashland, Mass.




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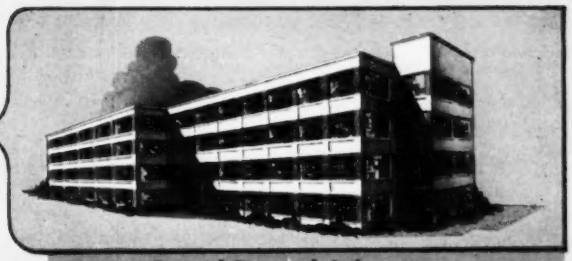

Central Research Laboratory, Easton, Pa.

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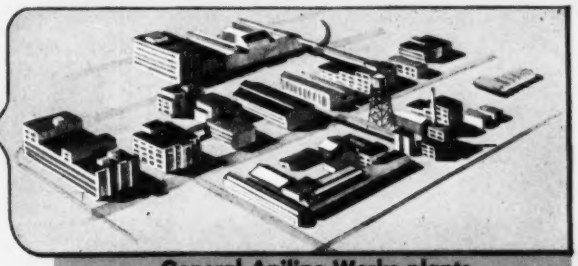
. . . of production plants such as these



General Aniline Works plants at Grasselli, N. J. & Rensselaer, N. Y.

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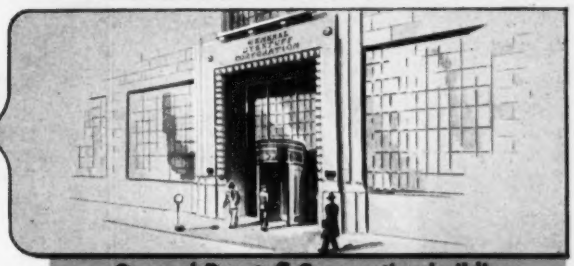

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